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ARMSTRONG LABORATORY

WASTEWATER CHARACTERIZATION SURVEY, CHARLOTTE AIR NATIONAL GUARD BASE, NORTH CAROLINA

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Final Technical Report for 01 - 09 March 1994

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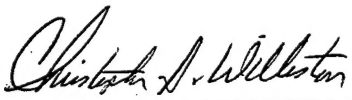

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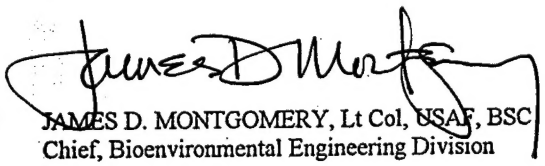

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13. ABSTRACT *(Maximum 200 words)*

Personnel from the Armstrong Laboratory Water Quality Branch conducted a wastewater characterization survey for the 145th TAC Clinic, Charlotte Air National Guard Base, North Carolina, from 1-9 March 1994. The scope of the survey was to sample wastewater throughout the base to determine if significant pollutant concentrations exist in the wastwater discharge, and how much is coming onto the base from the commercial operations located adjacent to the base. The base currently has very stringent permit levels and the three effluent sampling locations indicated that the sanitary discharge does exceed these levels. The parameters that exceed these limits are; metals, BOD, and Total Suspended Solids. These constituents are at levels typical of sanitary sewage, and the permit levels should be renegotiated.

The base also ask that we evaluate the Geographically Separated Unit (GSU) located at Badin NC. The sanitary did not appear unusual for the operations conducted there, however the potable water did contain some chlorinated solvents.

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WASTEWATER CHARACTERIZATION SURVEY,

Charlotte Air National Guard Base, North Carolina

INTRODUCTION

A wastewater characterization survey was conducted at Charlotte Air National Guard Base (CANGB), North Carolina from 1-9 March 1994 by personnel from the Armstrong Laboratory, Water Quality Branch. The main purposes of this survey were to characterize the wastewater, determine the impact of present waste sewer disposal practices, and evaluate the need for routine sampling or monitoring.

The object of this survey was to determine the sources and discharge concentrations of the sanitary effluent of CANGB to the Charlotte-Mecklenburg Wastewater System and to meet compliance standards. In addition to the wastewater characterization survey, the two sanitary sewage discharge at the Geographically Separated Unit (GSU) were evaluated for various analytical parameters. The drinking water was also collected from the GSU and analyzed for Volatile Aromatic Organics, lead, and copper. There has been a problem with trichloroethylene (TCE) in the drinking water in addition to elevated levels of lead and copper.

The wastewater characterization survey was requested by the National Guard Bureau Bioenvironmental Engineer (NGB/SGPB). Copies of the request and response letters are at Appendix A. A proposed sampling plan, (See Appendix B) was created based on facility layouts provided by the base.

Armstrong Laboratory personnel performing the survey included Capt Christopher A. Williston, MSgt Terry Boyd and SSgt Robert P. Davis

DISCUSSION

Background

CANGB is located West of Charlotte NC in the East area of the International Airport. The GSU is located approximately 58 miles east of CANGB.

The CANGB installation is approximately 79 acres and shares the main runway with Charlotte International Airport, (See Appendix C). Currently 12 C-130 aircraft are operated out of this facility. This base appears to be well maintained and operated during the presurvey and survey

visits. There is one influent source to the base's sanitary sewage system coming from several commercially operated aircraft maintenance facilities. There are three discharge points from the base that all terminate at the Charlotte-Mecklenburg Wastewater System.

The GSU is approximately 21 acres and is also well maintained. There are two main facilities that service the communication mission at this site. There are two sanitary outfalls that are treated by a septic system and subsequent leach field.

Wastewater Sources

There is a source from off base that is generated from commercial activities at the airport. This sanitary stream was sampled at Site #1 at Manhole A-1. The fire department also discharges to this manhole (This fire department is jointly operated by the ANG and Charlotte International Airport). These commercial activities include, but are not limited to corrosion control, engine repair, refueling, and other related aircraft maintenance. This wastestream continues through the base and discharges out on the south-east side.

Several base facilities enter this influent. Most of these are administrative, operations, warehouse, and aeroport. These sources were sampled at Site #2 in Manhole B-4. The clinic, cafeteria, washrack, and warehouse also discharge into this wastestream. These sources were sampled at Site #3 in Manhole E' (previously 006). These on-base sources commingle with the commercial off-base and fire department source and pass through a newly constructed manhole located south of the base next to the propane tank farm. This manhole is currently not labeled, however, the sampling point is designated Site #4.

The south sanitary discharge of Hangar 51, Non Destructive Inspection (NDI), Fabrication Shop, Engine Shop, and Engine Test Cell commingle at Manhole G and exit the base. This sampling point is Site #5.

The north engine test cell; Petroleum, Oils and Lubricants (POL); and the north side of Hangar 51 discharge toward the north base effluent. These sanitary discharges were sampled at Site #7 at Manhole SS-1E. The sanitary line continues toward the Civil Engineering (CE) complex where Entomology, CE, AGE, Motorpool and some warehouses commingle to the sanitary and exit the base north of the CE building. A manhole located off-base on the east side of Airport Drive south of the tributary of Taggart Creek is where sampling

Site #6 is located. Two sanitary pipes from the base discharge at this location. The pipe from the CE complex was used for Site #8 when the entomology shop floor drain was flushed.

Two sanitary and one potable sampling points were at the GSU located outside of Badin, North Carolina. Site #10 was located at the Communications' training facility outside of Building #5. This sampling point was in an unmarked manhole located southeast of the building. Site #11 was located northeast of Vehicle Maintenance Building #2. This sample was collected from the influent side of the oil/water separator (O/WS).

Wastewater Permit Standards

Domestic (also called *sanitary*) *wastewater*, is defined by Metcalf & Eddy as, "Wastewater discharged from residences and from commercial, institutional, and similar facilities." *Industrial wastewater* is defined as, "Wastewater in which industrial wastes predominate." Charlotte Air National Guard Base is classified as an industrial discharger to Charlotte-Mecklenburg Wastewater System. Charlotte-Mecklenburg Wastewater System combines CANGB effluent with community discharges. The State of North Carolina Environmental Protection Agency (EPA) has standard discharge standards that all industrial and domestic dischargers must follow. These standards are stringent, especially for metals, however currently there has not been a discharge problem according to the plant operators pursuant to conversations with SSgt Ingram.

The Industrial Pretreatment Standards, which fall under the National Pollution Discharge Elimination System (NPDES) Permitting Program, impose general prohibitions on industrial dischargers to Publicly Owned Treatment Works (POTWs) and specific prohibitions on industrial dischargers which fall into specific categories of industries. Categorical discharge limitations established by the Industrial Pretreatment Standards have been promulgated for certain categories of industries. The industrial categories, under which typical U.S. Air Force (USAF) operations may fall, include electroplating, metal finishing, photographic processing, and hospitals. Charlotte Air National Guard Base does not conduct logistics type repairs. Medium aircraft and component maintenance is conducted there with some low volume photographic development in graphics and the clinic.

Section 23-45 of the Water, Sewers and Sewage Disposal regulations provided by the local POTW outlines the general prohibitions on discharges from industrial users to include (a) pollutants which create a fire or explosion hazard, (b) pollutants which will cause corrosive structural damage to the POTW, (c) solid or viscous pollutants in amounts which will obstruct flow in the POTW resulting in interference, (d) any pollutant, including oxygen-demanding pollutants released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW, and (e) heat levels which will inhibit biological activity in the POTW resulting in interference. Charlotte ANGB discharges to a POTW and must comply with state and local regulations.

CMUD has its own ordinance for wastewater effluent levels. Some of these special restriction are as follows:

1. Compatible pollutants

a. Any Total Suspended Solids (TSS) in concentrations greater than 250.0 mg/L based on a composite sample.

b. Any Biochemical Oxygen Demand (BOD) in concentrations greater than 235.0 mg/L based on a composite sample.

2. Non-compatible pollutants: No industrial user shall discharge wastewater containing in excess of:

Total Arsenic (As)	0.050 mg/L
Total Cadmium (Cd)	0.003 mg/L
Total Copper (Cu)	0.060 mg/L
Total Cyanide (Cn)	0.040 mg/L
Total Lead (Pb)	0.050 mg/L
Total Mercury (Hg)	0.003 mg/L
Total Nickel (Ni)	0.050 mg/L
Total Silver (Ag)	0.010 mg/L
Total Chromium (Cr)	0.050 mg/L
Total Zinc (Zn)	0.180 mg/L

unless issued a permit in accordance with section 23-52. Composite and grab sampling and associate site locations should be spelled out in their permit.

Stormwater Permit Standard

Charlotte ANGB does not yet have NPDES permits for the stormwater outfalls at the base or the GSU; however, storm water permit applications have been submitted to the North

Carolina Department of Natural Resources as part of a group permit with the International Airport. The GSU also has a general group permit applied for through the Army National Guard in Raleigh NC

The Clean Water Act of 1987 contains provisions specifically addressing discharges from storm drainage systems. Section 402 (p)(3)(B) provides that permits for such discharges:

1. May be issued on a system or jurisdictions-wide basis.

2. Shall include a requirement to effectively prohibit non-storm water discharges into storm drains, and

3. Shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

In response to these provisions, the EPA issued a final rule to begin implementation of section 402(p) of the Clean Water Act on November 16, 1990 (40 CFR parts 122, 123, and 124 National Pollution Discharge Elimination System Permit Regulations for Storm Water Discharges, Federal Register, Vol. 55, No. 222). A screening approach which includes chemical testing of outfalls or storm drainage with dry-weather flow (defined by a 72-hour antecedent dry period), was adopted. The parameters to be tested are a combination of several pollutants of concern and "tracers" that may be used to help identify contaminated outfalls and predict the source of illicit discharges (EPA/600/R-92/238, January 1993).

Sampling Strategy

A presurvey was conducted from 23-26 September 1993 by Capt Williston of AL/OEBW. Sampling sites had been previously proposed based on Utility Maps provided by SGPB. The sample sites are widely dispersed throughout the base. The sites were selected based on potential sources of contaminants, sewage branch lines draining off key industrial areas, and flow. These sites were inspected during the presurvey to insure accessibility and sufficient flow rates. A copy of the sampling strategy is at Appendix B. A map showing the locations of the wastewater sampling sites is in Appendix C.

A description of the 11 sampling sites follows:

Site 1: Base Influent, located on the southwest base line at Manhole A-1. Butler Aviation repair facilities discharge to this point. The NCANG Fire Department also discharges to this manhole. Twenty-four hour composite samples were collected over four days. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics for 2-days), EPA Methods 624 & 625 (Total Toxic Organic Compounds for 1-day), EPA Method 608 (Pesticides and PCB's for 1-day), Ammonia, TKN, Nitrate, Nitrite Nitrogen, Oils and Greases (O&G), Total Petroleum Hydrocarbons (TPH), Total Metals, BOD, COD, Total Phosphorus, Arsenic, Cyanide, Phenols, Total, Solids, On-site Water Temperature and pH.

Site 2: Buildings 2, 3, 4, & 5 Effluent, located in the southwest parking lot. Samples were collected over three days. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics), Ammonia, TKN, Nitrate, Nitrite nitrogen, O&G, TPH, Total Metals, COD, Total Phosphorus, Cyanide, Phenols, Total Solids, On-Site Water Temperature and pH.

Site 3: Buildings 1, 6, 17, 18, 20, 45, and 52 effluent located at Manhole E'. Samples were collected over three days. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics), O&G, TPH, Total Metals, COD, Total Phosphorus, Arsenic, Cyanide, Phenols, Total Solids, On-Site Water Temperature and pH.

Site 4: South Base Effluent, the collection point is at manhole located off-base northeast of the propane refueling station. Samples were collected over four days. Analyses at this location included: Ammonia, EPA methods 601/602 (Purgeable Halocarbons and Aromatics for 2-days), EPA Methods 624 & 625 (Total Toxic Organic Compounds for 1-day), EPA Method 608 (Pesticides and PCB's for 1-day), O&G, Total Petroleum Hydrocarbons (TPH), Total Metals, COD, Total Phosphorus, Arsenic, Cyanide, Phenols, Total Suspended Solids, On-Site Water Temperature and pH.

Site 5: East Base Effluent, the Non Destructive Inspection (NDI), Maintenance Shop oil/water separator located north of Building 7, and Buildings 22, 23, 42 and 51 effluent. The sample site is in Manhole G. Samples were collected over three days. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics), O&G, TPH, Total Metals, COD, Total Phosphorus, Arsenic, Cyanide, Phenols, Total Solids, On-Site Water Temperature and pH.

Site 6: North Base Effluent, Buildings 16, 31, 34, 44, 49, effluents. The major concern at this location is the Aerospace Ground Equipment (AGE) and Vehicle Maintenance operations. The sampling location is manhole SS-2A. Samples were collected over three days. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics for 2-days), EPA Methods 624 & 625 (Total Toxic Organic Compounds for 1-day), EPA Method 608 (Pesticides and PCB's for 1-day), O&G, TPH, Total Metals, COD, Total Phosphorus, Arsenic, Cyanide, Phenols, Total Solids, On-Site Water Temperature and pH.

Site 7: Engine Test Pad, Base Fuel Shop and Hangar 51 Oil/Water Separator. The collection point is at manhole SS-1E. Samples were collected over three days. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics), O&G, Total Petroleum Hydrocarbons (TPH), Total Metals, COD, Phenols, Total Solids, On-Site Water Temperature and pH.

Site 8: Civil Engineering. The location of this site is at a clean-out SA-1AA, located northeast of Building 43. Sampling involved a forced flushed composite collection. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics), EPA methods 608 (Pesticides and Herbicides), O&G, Total Petroleum Hydrocarbons (TPH), Total Phosphorus, Arsenic, Cyanide, Phenols, On-Site Water Temperature and pH.

Site 9: GSU Building #5 Oil/Water Separator effluent. Samples were collected as a grab sample. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics), O&G, Total Petroleum Hydrocarbons (TPH), Total Metals, COD, Total Phosphorus, Arsenic, Cyanide, Phenols, Total Solids, On-Site Water Temperature and pH.

Site 10: GSU Building #2 Oil/Water Separator effluent. Samples were collected as a grab sample. Analyses at this location included: EPA methods 601/602 (Purgeable Halocarbons and Aromatics), O&G, Total Petroleum Hydrocarbons (TPH), Total Metals, COD, Total Phosphorus, Arsenic, Cyanide, Phenols, Total Solids, On-Site Water Temperature and pH.

Potable Drinking Water from Building 4: A sample of potable water was collected from the base drinking water supply at Building 4. This sample was collected to identify possible source elements that in turn add to the effluent concentration. Analyses at this source included: EPA

Methods 601/602 (Purgeable Halocarbons and Aromatics), O&G, TPH, total metals, ammonia, COD, cyanide, phenols, nitrate, nitrite, kjeldahl nitrogen, total acidity, total alkalinity, temperature, total phosphorus, and pH.

A second potable water sample was collected at GSU Building #5 to identify if chlorinated compounds still persisted in the drinking water at this location. Analyses at this source included: EPA Methods 601/602 (Purgeable Halocarbons and Aromatics).

Sampling Methods

Wastewater samples were typically collected over a 24-hour period as a time-proportional composite. Ice was added in sufficient quantity to the sampler's base insuring the wastewater being composited in the 2.5-gallon (10-liter) jar was maintained at ≤4°C. At the end of the compositing period, each water sample was stirred to mix the solids thoroughly and the contents poured directly from the jar into appropriate prelabeled sample containers and placed in a cooler filled with ice. The collection jar was replaced with a clean jar prior to each sampling interval. After all the samples were collected for each time period, they were transported in coolers to the temporary work center (located at Building 4), where appropriate preservatives were placed in each bottle. The samples were then placed in a refrigerator. They were placed in insulated shipping coolers, packed with blue ice, transported to TMO and shipped overnight to Armstrong Analytical Laboratory and their contract laboratory.

Samples collected for volatile organic halocarbons and aromatics, oils and greases, total petroleum hydrocarbons, total solids or residues and the volatile fraction of total toxic organics were collected as grab samples. These samples were captured directly from the wastestream and then poured directly into the appropriate sample container. The samples were preserved and shipped in the same conditions as the previously mentioned samples.

The water sample pH and temperature were taken from each site's wastestream and recorded daily along with pertinent information relevant to the sample integrity (rain, odor, color, sampler condition, etc.).

All samples were collected and analyzed using Environmental Protection Agency approved procedures. Sample preservation was in accordance with the AFOEHL Sampling Guide, March 1989.

Field Quality Assurance/Quality Control (QA/QC)

A field QA/QC program was used during this survey to verify the accuracy and reproducibility of laboratory results. The following types of samples were collected:

Equipment Blank Samples: Equipment blank samples were collected by pumping a liter of Laboratory Grade distilled water through the pump/purge cycle of the sampler into the appropriate sample container. Preservation and shipping was conducted in the same manner as the routine samples. These samples are used to check for cross contamination from the sampler, which may leach contaminants into the sample through residuals or desorption from the sampler tubing.

Reagent Blank Samples: Reagent blank samples are made by adding a standard aliquot of reagent preservative to a standard sample volume of Laboratory Grade distilled water. These samples are analyzed for analytical parameters that were collected in the field. These samples serve to verify that the reagent does not add quantitative value to the analyte from its own matrix.

Duplicate Samples: Duplicate samples are collected by splitting grab or composite samples with a sample splitter under identical protocol. Sample collection is accomplished by splitting the samples in the 2.5-gallon (10-liter) jar or grabbing double samples of each analyte. Each group of two samples is managed the same regarding collection, handling, preservation, storage, and shipment. This series monitors the reproducibility of sample analytical results. It should be noted that even with the use of a sample splitter, replicating duplicate sample results is difficult because changes in flow and unequal capture of solids can contribute to variability between the original and the duplicate sample.

Analytical Laboratory QA/QC

The Armstrong Laboratory Analytical Division Quality Assurance Plan establishes the guidelines and rules necessary to meet the analytical requirements of 43 states, US EPA, and private accrediting agencies (Appendix G). Specific activities include: (a) inserting a minimum of one blind sample control for each parameter analyzed on a monthly basis, (b) periodic audit of the quality assurance items from each branch, (c) daily calibration of equipment, (d) a minimum of one National Institute Standards and

Technology/Standard Reference Materials (NIST/SRM) traceable standard and control sample that is included with each analytical run, (e) corrective action documented each time a quality assurance is not met, (f) established detection limits for all sample data, (g) participation by the laboratory in numerous proficiency surveys and interlaboratory quality evaluation programs, and (h) plotting and tracking all quality control samples by the appropriate analytical section.

Quality assurance, also mandatory for all contracted analytical services, is validated periodically by Armstrong Laboratory personnel.

Spike Samples: Spike samples were prepared by Armstrong Laboratory's Analytical Services Division. These samples were prepared by filling the appropriate sample container with laboratory grade distilled water, adding a known quantity of an analytical parameter, and preserving the sample as appropriate. This series monitors the sample collection, preservation, and reproducibility of analytical results. Spike samples were split at the lab, brought to CANGB and shipped to the contract lab to evaluate sample integrity and duplication.

RESULTS AND CONCLUSIONS FOR WASTEWATER CHARACTERIZATION

Contaminant concentrations and physical and chemical parameters are presented in the following section to characterize the various wastewater streams sampled during the survey. Some of the concentrations show potential problems with disposal methods. Others simply contribute to the identifying characteristics of the wastewater that reflect the types of materials being discharged into the sewers. Please note that all analytical results by site number may be found in Appendix D.

The results are segregated into tables as follows:

Table No.	
DA-1	Site 1, Base Influent From Commercial AC Maintenance
DA-2	Site 1, Base Influent From Commercial AC Maintenance
DA-3	Site 1, Base Influent From Commercial AC Maintenance
DB-1	Site 2, Operations Discharge
DC-1	Site 3, Clinic, Cafeteria, and Washrack Discharge

DD-1	Site 4, South Base Effluent
DD-2	Site 4, South Base Effluent
DE-1	Site 5, East Base Effluent
DE-2	Site 5, East Base Effluent
DF-1	Site 6, North Base Effluent
DF-2	Site 6, North Base Effluent
DG-1	Site 7, North Base Activity
DH-1	Site 8, Civil Engineering
DI-1	Site 9, GSU Building #5
DJ-1	Site 10, GSU Building #2
DK-1	Potable Water
DL-1	Spike Sample And Reagent Blank
DL-2	QA/QC - Equipment Blanks

Oils, Greases and Total Petroleum Hydrocarbons

Oil and Grease (O&G) is not a specific analysis because a group of substances with similar properties are measured due to their solubility in trichlorotrifluoroethane. Some of these compounds could include organic dyes, sulfur compounds, and chlorophyll. Total Petroleum Hydrocarbons (TPH) compounds are extracted and analyzed in the same manner as O&G; however, after measuring for O&G with a infrared detector, a silica gel is added to the sample to absorb the nonpetroleum compounds and remeasured (Standard Methods 18th Edition). Total Petroleum Hydrocarbons compounds detected can originate from detergents and other domestic sources, and not solely from fuels.

Tables DA-1 through DK-1 indicate few elevated levels of O&G. Table DG-1 indicates the most elevated O&G sample collected during the survey. This sample was measured at 480 mg/L. The associated TPH level, only 70.4 mg/L, indicated that the origin of the O&G found was not predominately petroleum.

Chemical Oxygen and Biochemical Oxygen Demand

Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) are two common analytical procedures to determine the oxygen demand of a water sample. This demand may be caused by biodegradable organics, nutrients, refractory organics, heavy metals or dissolved inorganic solids. The BOD_5 procedure requires five days to incubate the microbes which biochemically exert an oxygen demand. This procedure must begin within 24 hours after the sample is collected. The results can also vary depending on the microbial colony and concentration of contaminants. The COD procedure, with a holding time of up to 28 days, utilizes a chemical oxidizer to determine the oxygen demand. This procedure is more consistent than the BOD procedure. The BOD samples were directly transported locally to the Microbac, BAW Laboratory Division. The COD samples were analyzed at Armstrong Laboratories.

Tables DA-1 through DK-1 indicate few elevated levels of BOD and COD. Table DG-1 indicates the most elevated COD sample collected during the survey. This sample was measured at 5350 mg/L. The COD levels detected on all four sampling days indicated elevated levels for the operations conducted upstream of this collection point. This is also due to the conservative water appliances used in Hangar 51 as evident by the corresponding elevated total solids found at Site 7. Table DC-1 indicates that the operations conducted upstream of Site 3 have moderate levels of COD; however two of the four days did appear elevated. This concentration can be attributed to the increased cafeteria activity during the Unit Training Assignment (UTA) weekend. There may have been some additional contribution from the washrack during that same weekend. Tables DD-1, DE-1, and DF-1 indicate that the BOD levels in the base effluent are all above the regulated levels as outlined in Ordinance 23-45. These O&G and TPH levels however, are typical for the sanitary sources located on the base.

Total Cyanides

Total cyanides were analyzed at selected sites throughout the base. Almost all of the samples indicated detectable levels. These are low levels and the sources can most probably be attributed to the ingredients of the pesticides used at these facilities.

Miscellaneous Analyses

Phenolic compounds are used in many products from cough syrup to cleaning compounds. The most elevated levels

(233 µg/L) were detected at Site 6 on Sunday and Monday. This concentration occurred during the Air National Guard UTA weekend; it would indicate more cleaning activities may have occurred. These values are within normal ranges of some domestic wastewaters and not excessively elevated.

The remaining analyses from Groups A, D, E, and field readings do not indicate any significant industrial discharges from these facilities.

Group G Parameters and Surfactants

Total acidity, alkalinity, bicarbonate alkalinity, and solids analyses for potable water are compiled in Table DK-1. The acidity, alkalinity and surfactant levels detected throughout the survey do not appear unusual. Total solids are listed in Tables DA-1 through DJ-1.

The solids levels found at Site 7 was the most elevated. The solids levels leaving the base at Site 6 were also elevated, mostly likely from the sources represented at Site 7. There is a permit level for Total Suspended Solids (TSS), but not for total solids. The total solids levels observed at the three base outfalls did not appear abnormal. Composite TSS should be repeated at Site 6 to confirm compliance permit limits.

Metals Analyses

Total metal analyses were performed on the wastewater samples by Induction Coupled Plasma (ICP) and Graphite Furnace methods. The base effluent at Site 4 indicated no abnormally elevated levels of metals except for a minor excursion of zinc (See Table DD-1). The other effluent sites 5 and 6 exhibited permitted levels of concern for total metals. Site 5 had elevated levels by permit limits of cadmium, copper, silver and zinc (See Table DE-1). Site 6 had elevated levels by permit limits of cadmium, and zinc (See Table DF-1). Zinc was the only elevated level coming onto the base as monitored at Site 1 (See Table DA-1). One of the cadmium sources at an air base with C-130s is the washrack. Wash records could confirm if aircraft were washed on the UTA for March 1994. Cadmium levels above the permit level were detected at Influent and Effluent Sites 1, 4, 5, and 6.

It should be noted that the most elevated metals detected at the sites on base were at Site 7. This site was also the only one with detectable levels of mercury. Unless avionics or weather operations occur at Hangar 51, the

source of mercury would be difficult to determine without record searches and further monitoring upstream from Site 7. An isolated release of mercury three decades ago will leave trace levels such as those found at Site 7 (See Table DG-1). Drain traps can store and seep mercury for years. It would be prudent to check and clean traps discharging to Site 7.

Volatile Organic Compounds (GC)

Volatile Organic Compounds (VOCs) were analyzed via EPA Methods 601 (Volatile Organic Hydrocarbons), 602 (Volatile Organic Aromatics).

VOCs are widely used in many products and are also by-products of ongoing processes throughout any USAF base. Usually, the small amounts that enter the sanitary system are treated by biodegradation or volatilization. Small amounts are routinely treated with no impact to the biological treatment system. Large amounts, however, can cause a toxic shock to the system in the POTW and create a fire or explosion hazard.

The VOCs present in the base effluent are not significantly elevated with the exception of benzene and toluene. The highest benzene level was 323.7 µg/L at Site 6. The highest toluene level was detected the same site and day at 518.4 µg/L (See Table DF-1). The most consistent detection of toluene was noted at Site 4. The most likely source may be upstream from Site 3. Benzene and Toluene are fuel components; they also have many other potential sources.

Other compounds present at various sites are benzene, bromomethane, 2-Chloroethyvinyl Ether, chloroform, chloromethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene 1,4-Dichlorobenzene, ethylbenzene, methylene chloride, 1,1,1-Trichloroethane, vinyl chloride, and xylene. Bromodichloromethane and chloroform are byproducts from chlorination. The other compounds can be traced to fuels, paints, cleaners and solvents. Most of the sites had relatively low levels of these compounds with the exception of Site 6.

Sites 4, 5, and 6 effluents contained: chlorobenzene, chloroform, chloromethane, 1,4-Dichlorobenzene, 1,2 Dichloroethane, ethylbenzene, and toluene. The source of these compounds may be traced to the other upstream sampling points that also have the same constituents. From that sampling point, the source will have to be determined by the

operations that are conducted in the facilities that discharge to that sampling point. Chloroform was detected in the potable water sample and is a disinfection byproduct. Therefore, it will not be considered as a release from any particular operation, because it appears to be at the ambient level in the potable water source.

Para-Dichlorobenzene or 1,4 Dichlorobenzene is predominantly used as a insecticidal fumigant and a deodorant for garbage and restrooms. It has minor uses in resins and abrasive wheel production. This compound is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978, (40 CFR 116.4 (7/1/87)). This compound, a toxic pollutant pursuant to section 307(a)(1) of the Clean Water Act, is subject to effluent limitations (40 CFR 401.15 [7/1/90]). It was not detected at any base effluent; however, it was detected in minor amounts at Site 3. It should be noted that the EPA is promulgating National Primary Drinking Water Regulations (NPDWRs) for certain volatile synthetic organic chemicals. Specifically, this notice promulgates a maximum contaminant level for para-dichlorobenzene at 75.0 ppb. Drinking water standards should not be used for sanitary effluent standards. It would appear, however, that if the maximum detected level of para-dichlorobenzene from the sanitary sewer is less than the NPDWRs standard, then there should be minimal concern in removing deodorizers from the base supply.

Vinyl Chloride is used in the manufacture of numerous products in building and construction, automotive industry, electrical wire insulation and cables, piping and is heavily depended upon by the rubber, paper, and glass industry. It is also a byproduct when Trichloroethylene biodegrades. This compound, a toxic pollutant pursuant to section 307(a)(1) of the Clean Water Act, is subject to effluent limitations (40 CFR 401.15 [7/1/88]). It was detected in the Base's effluent at Site 5 on 5 March 1994 at a low level of 2.71 ppb.

Toluene is used in: Solvents for paints, lacquers, gums, and resins; as a gasoline and aviation fuel additive; inks; cements; cosmetics; spot removers; antifreezes; and fuel blending. Toluene, designated a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act, is further regulated by the Clean Water Act Amendments of 1977 and 1978, (40 CFR 116.4 [7/1/88]). This compound, a toxic pollutant pursuant to section 307(a)(1) of the Clean Water Act, is subject to effluent limitations (40 CFR 401.15 [7/1/91]). It was detected in the Base's

effluent at Sites 4, 5, and 6 most days that it was sampled at concentrations of 1.58 to 518.4 ppb. It was also detected in some of the water sample collected from Sites 3, and 7. These levels can be reduced by better spill response and oil/water separator maintenance. These are not flammable levels however, prudent measures should be taken to mitigate further toluene releases into the sanitary.

Xylene is used in: Solvents; manufacturing Dyes; production of benzoic acid, manufacture of paints, lacquers, general solvent, and adhesives; as a gasoline and aviation fuel additive; and protective coatings. Xylene, designated a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act, is further regulated by the Clean Water Act Amendments of 1977 and 1978, (40 CFR 116.4 [7/1/88]). It was detected in the Base's effluent at Sites 4, 5, and 6 most days that it was sampled at concentrations of 1.1 to 409.1 ppb. It was also detected in two of the water sample collected from Site 7, (See Table DG-1).

Total Toxic Organic Compounds

Total Toxic Organic (TTO) compounds are detected with EPA Methods 608, 624 and 625. These are purgeable, base-, neutral-, and acid-extractable organic compounds. Total Toxic Organics analyses are very expensive and were therefore limited to influent flows to, and effluent discharges from the base at Sites 1, 4, 5, and 6.

Tables DA-2, DD-2, DE-2, and DF-5 list the Polychlorinated Biphenyls (PCBs), pesticides, volatile, base-neutral, and acid-extractable compounds for the base influent and effluent at Sites 1, 4, 5, and 6. No PCBs or pesticides were detected. Low to moderate levels of base-neutral compounds were detected in addition to the typical volatile compounds described in the previous section. The other organic compounds found in the TTO analyses are described as follows:

Bis (2-Ethylhexl)Phthalate is used in: a plasticizers for polymeric materials such as natural rubber, synthetic rubber, cellulose acetate butyrate, polystyrene; vacuum pump oil; dielectric fluids for capacitors; inert ingredients for pesticides; insect repellent formulations; cosmetics; rubbing alcohol; and photographic film, wire and cable adhesives, and cubitainers and lab plasticware. It is also one of the most common lab contaminants and can be found in most waters that are conveyed through polyvinylchloride (PVC) plumbing. This compound has a human criteria for ingestion of water at 15.0 mg/L. Contaminated aquatic

organisms criteria is set at 50 mg/L. This compound, designated a toxic pollutant pursuant to section 307(a)(1) of the CWA, is subject to effluent limitations. It was detected at Sites 1 and Site 4 at 30 and 150 µg/L respectively.

Diethyl Phthalate is used in: celluloid; solvents for cellulose acetate in manufacturing varnishes and dopes; denatured alcohol; wetting agents; insecticidal sprays; camphor substitutes; mosquito repellents; dye carriers; and plasticizers. This is also a common laboratory contaminant and is often found in water that is conveyed through pvc plumbing. This compound, designated a toxic pollutant pursuant to section 307(a)(1) of the Clean Water Act, is subject to effluent limitations (40 CFR 401.15 [7/1/87]). It was detected at Site 1 at the detection limit of 70 µg/L on 6 March 1994.

Naphthalene is used in: wood preservative; moth repellent and insecticide; manufacture of phthalic and anthranilic acids, smokeless powder, synthetic resins, hydronaphthalene, and sulfonic acid; antiseptic and vermicide; and ingredient for toilet deodorant. This compound, designated a toxic pollutant pursuant to section 307(a)(1) of the Clean Water Act, is subject to effluent limitations /polynuclear aromatic hydrocarbon/(40 CFR 401.15 (7/1/87)). It was detected at Site 4 at the 60 µg/L on 6 March 1994.

Phenol is used in: antiseptics; disinfectants; peptizing agents in glues; germicidal paints and slimicides; disinfectant against vegetative gram-negative and gram-positive bacteria; and extractive solvents for petroleum refining. The estimated permissible concentration of phenol in water as applied for human health effects ranges from 260 to 675 µg/L pursuant to Volume 1. EPA-600/7-77-136a. Research Triangle Park, NC: EPA, Nov. 1977., p. E-182. This compound, a toxic pollutant pursuant to section 307(a)(1) of the Clean Water Act, is subject to effluent limitations (40 CFR 401.15 [7/1/87]). The acid extractable compound was detected at Site 1, at 20 µg/L on 6 March 1994.

QA/QC DATA

Table DK-1, lists the analytical results for the potable water from Building 4 and GSU Building #5. The analyses performed on the potable water reveal what chemical concentrations and impurities are found in the incoming treated water. These levels can be subtracted from the

concentrations revealed by the analyses performed on the sanitary outfalls to determine the additive effects of effluents on the system. Iron is found throughout the entire survey at approximately 50 to 8400 µg/L. If a sample indicated a level of 400 µg/L , then the ambient or background level of 280 µg/L would be subtracted from the 400 µg/L for an reading of 120 µg/L. The potable water contains detectable concentrations of calcium, iron, zinc, oil and grease, kjeldahl nitrogen, and solids or residues. All of these levels are below the drinking water MCLs.

Tables DL-1 indicate spike samples that were created at Armstrong Laboratory. These samples were preserved and shipped to AL/OEA for analyses. These results are supposed to fall within an acceptable window or advisory range. Most of the results fell within this window. Few other analytes fell close to this window or were not analyzed for that particular parameter. Variances can be the results of matrix interferences, poor recovery, or technician error. The laboratory re-analyzes if sample falls outside prescribed limits. These results indicate fairly good recovery.

Reagent blanks, collected and analyzed to determine if there are other interferences due to the reagent composition, are prepared by filling typical sample bottles with laboratory grade water and preserving them with the standard reagent used in the field. These blank samples are analyzed for the same parameters as those requested for the field samples. If there are significant values detected, then that value may be subtracted from the gross levels detected in the field sample for a net gain. The reagent blank results listed in Table DL-1, indicate that three parameters were detected. The sulfuric acid used to preserve Groups A and E analytes indicated a low, near detection level of chemical oxygen demand of 17.0 mg/L. The nitric acid used in the preservation of metals indicated a detectable level of 0.02 mg/L of iron. These levels are not significant with respect to the levels detected in the sanitary waste water samples collected. Therefore the levels detected throughout the survey may be accepted as valid. The potable water analytes detected should still be considered when reviewing the samples collected throughout the base.

SUMMARY AND RECOMMENDATIONS

Overall, the analyses collected at the base's effluent at Sites 4 and 5 appeared normal for the operations conducted at this location. However, several analyte parameters exceeded the local permit as outlined in Ordinance 23-45. Discussions with the operators at the local POTW indicate that there is currently not a problem. A permit with reasonable levels should be issued for the base so that there is some legal standing with regard to Notices of Violations (NOVs). The Clean Water Act and the Federal Facilities Act make it quite clear that fines of $25,000/day/analyte can be assessed back, if it can be proven that the base was in compliance. Contribution of industrial pollutants to the base's sanitary wastewater discharge were detected. Minor levels of organic and inorganic compounds were found. These samples were collected over the UTA weekend.

Site 3 had elevated levels of cadmium. This is most likely generated from scrubbing the C-130 with the aggressive green pads. Cadmium bearing paint is rubbed off and cadmium deposited on aircraft skin from engine operation, and washed down the sanitary. Washing engines also generates heavy metals in the wash water. A feasibility study should be conducted to determine if some secondary treatment is required. A simple change in the washing procedures and a sediment trap may be all that is needed to reduce the cadmium outfall levels.

There was a large amount of solids from Site 7. In addition, there were metals, solvents, and other constituents of concern that should be located and the sources reduced. There may be a sanitary maintenance problem with the lower water use appliances, unless preventative maintenance flushing is performed. One suggestion is that fire trucks must flush out the tankers periodically along with testing the pumps. This tanker testing can complement the needed sanitary sewer flushing at Site 7. The mercury found at Site 7 can be back-traced to the source. It may be an old release that will require line or trap cleaning.

CONCLUSIONS

The final effluent appears to be out of compliance with the current permit in regard to BOD, cadmium, copper, total suspended solids, and zinc content. However, no NOVs have been issued. This permit issue and the status of the base as being an industrial discharger versus a domestic

discharger should be resolved. The flow rate did not appear to be excessive; however, some infiltration and inflow has occurred in the past according to SSgt Ingram. A comprehensive feasibility study should be conducted to evaluate options for overhauling the sanitary lines in the oldest sections of the base. An oil/water separator preventative maintenance program should be implemented in addition to evaluating spill prevention devices in areas that may allow fuel spills to enter the sanitary.

REFERENCES

Investigation of Inappropriate Pollutant Entries into Storm Drainage System; EPA/600/R-92/238; United States Environmental Protection Agency; Jan 1993.

Wastewater Engineering Treatment, Disposal, and Reuse; Metcalf & Eddy, Inc.; McGraw-Hill, Inc.; 1991.

APPENDIX A

CORRESPONDENCE REQUESTING SURVEY

DEPARTMENT OF THE AIR FORCE
ARMSTRONG LABORATORY (AFMC)
BROOKS AIR FORCE BASE, TEXAS

05 NOV 1992

FROM: AL/OEBE
2402 E DR
Brooks AFB TX 78235-5114

SUBJ: Request for Wastewater Characterization Study (Your Ltr 30 Sep 92)

TO: 145 TAC Clinic/SGPB

1. We would be glad to assist you with a wastewater characterization survey. The sequence of events for these surveys is as follows:

a. Base provides background documentation, to include sanitary maps, historical sampling data, workplace chemical inventory data, copies of all pretreatment agreements and National Pollutant Discharge Elimination System permits, etc.

b. AL POC reviews the base-provided material, coordinates a tentative survey date, conducts a brief presurvey visit, and coordinates base support.

c. AL POC proposes a survey workplan to the base. The base concurs or proposes modification.

d. AL conducts the survey.

2. We have tentatively assigned Lt Williston as the project officer (DSN) 240-3305. Lt Williston is presently attending BEE school. An alternative POC for questions you may have at this time is Maj Garland at the same extension. Please send Lt Williston the material requested in paragraph 1(a).

EDWARD F. MAHER, Col, USAF, BSC
Chief, Bioenvironmental Engineering Division

cc: HQ ANGRC/SGB
HQ AFMC/SGB

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 145TH AIRLIFT GROUP, ANG
5225 MORRIS FIELD DRIVE, CHARLOTTE, NC 28208-5797

REPLY TO ATTN OF: 145 TAC Clinic/SGPB 30 September 1992

SUBJECT: Request For Wastewater Characterization Study.

TO: ANGRC/SGB, LTC Pontier

1. During a recent ECAMP inspection the need for a wastewater inventory was identified. This inventory has since been completed using data from projected usage of chemicals in shops. However, there has been no water sample data collected to establish a baseline characterization of the wastewater.

2. In talking with consultants at Armstrong Laboratory at Brooks AFB it was mentioned that there is a team available that can come to bases to conduct a wastewater characterization study. They informed us that a request for this team would have to be forwarded through our MAJCOM.

3. We would like to request that this team (geographical separated unit) come to our base to conduct this study. Also if possible we would like to simultaneously conduct this study at a GSU for which we provide support. This is the Badin Air National Guard. If you should need further information concerning this study please contact our office at AV 583-9327.

Russell E. Kraus

RUSSELL E. KRAUS, MAJ, NCANG
Bioenvironmental Engineer

cc: LTC Campbell
LTC Stonestreet
MAJ Robinson

To: AL/OEB 9 OCT 1992

Please support this request. You may deal directly with the unit with info copies of correspondance to us.

John H Pontier

JOHN H. PONTIER, Lt Col, USAF, BSC
Chief, Bioenvironmental Engineering
Office of the Air Surgeon

cc: 145 AG/SGPB

1.0 HRS 3 Nov 92 GA-21-4-D

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 145TH AIRLIFT GROUP, ANG
5225 MORRIS FIELD DRIVE, CHARLOTTE, NC 28208-5797

REPLY TO ATTN OF: 145 TAC Clinic/SGPB 10 December 1992

SUBJECT: Background Documentation Needed To Initiate Wastewater Characterization Study (Your Ltr 6 Nov 92).

TO: AL/OEBE, Lt Williston

1. Enclosed you will find sanitary maps for the Charlotte ANG and Badin ANG bases. From the maps you can see that there is no municipal sanitary sewer service for the Badin base. All wastewater disposal there takes place via on-site sewage disposal systems. The Charlotte base sewer system discharges into the Charlotte-Mecklenburg Wastewater system.

2. Also included with these maps are chemical inventories for the shops as well as results from environmental sampling that has been conducted on both bases. The inventories are grouped according to the buildings where the shops are found. In our environmental sampling program only one sampling site (006) is a sample site for the sanitary sewer system. All other points are stormwater and surface water sampling sites. The historical sampling data is also included for these sites.

3. At present there are no pretreatment agreements or National Pollutant Discharge Elimination System permits.

4. If you should have any further questions or need further information please contact our office at AV 583-9327.

Sam Ingram

SAM INGRAM, SSG, NCANG
Bioenvironmental Engineering Technician

cc: 145 CES/CES

APPENDIX B

SAMPLING STRATEGY

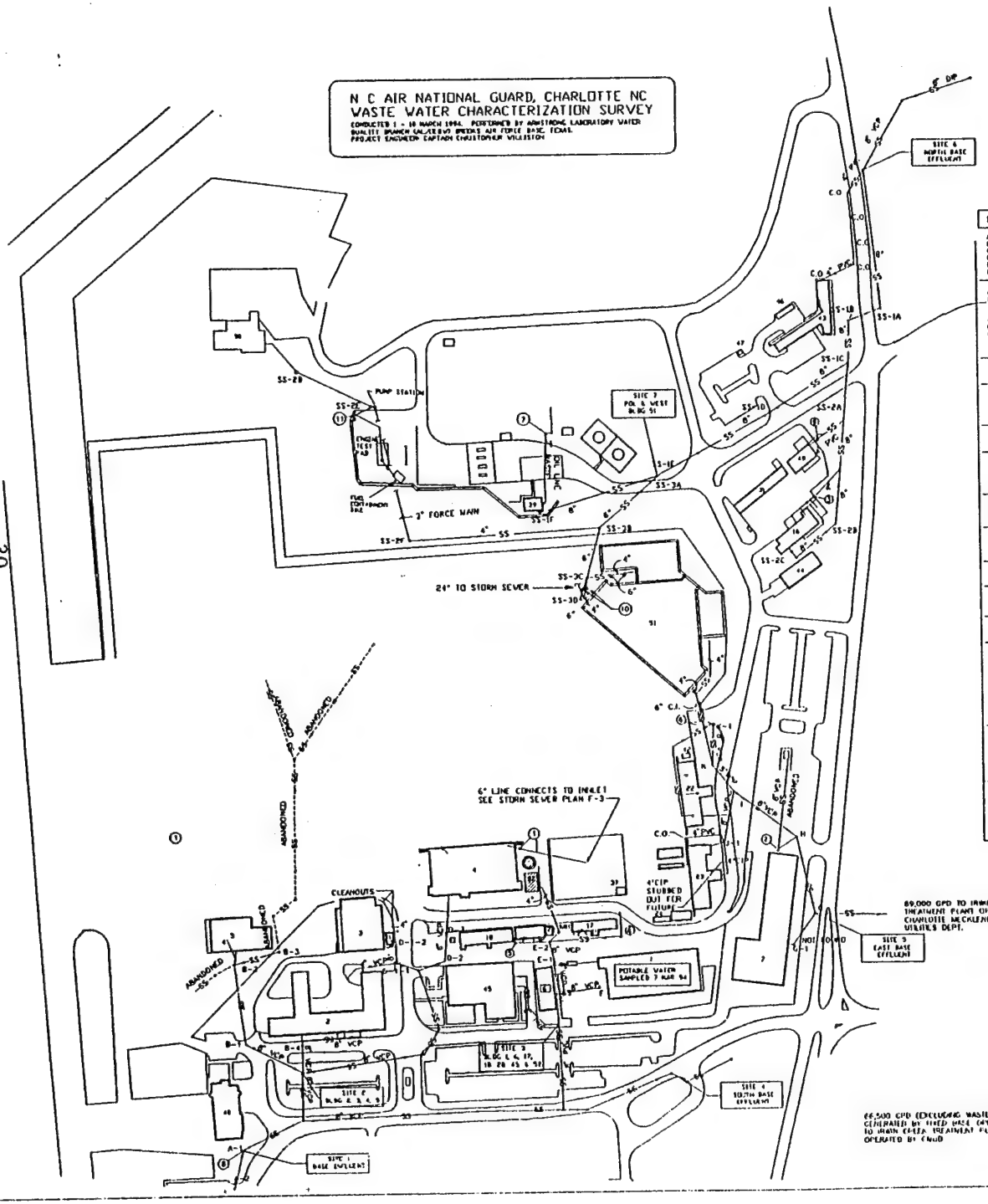
ANALYTES	Site-1	Site-2	Site-3	Site-4	Site-5	Site-6	Site-7	Site-8	Site-9	Site-10	QC/QA	Total
CHARLOTTE 1-9 MAR 94	Base Influent	Builds 2,3,4&5	uilds 1,6,17,18,20,45,&	South Base Effluent	East Base Effluent	North Base Effluent	Engine Test Cell	Civil Engineering	GSU Building #5	GSU Building #2		Samples
GROUP A	4 Day	4 Day	4 Day	4 Day	4 Day	4 Day	4 Day	2 Day Grab	1 Day	1 Day		
Ammonia	4	4		4	4	4					2	22
Chemical Oxygen Demand	4		4	4	4	4	4	2	1	1	4	32
Total Nitrogen	4	4		4	4	4		2				22
Nitrate												0
Nitrite												0
Oil & Grease	4	4	4	4	4	4	4	2	1	1	4	36
Total Petroleum Hydrocarbon	4	4	4	4	4	4	4	2	1	1	4	36
Biochemical Oxygen Demand	4			4	4	4					2	18
Orthophosphate												0
Total Phosphorus	4		4	4	4	4	4	2	1	1	3	31
												0
GROUP D												0
Cyanide, Total	4	4	4	4	4	4	4	2	1	1	2	34
GROUP E												
Phenols	4	4	4	4	4	4	4	2	1	1	5	37
												0
GROUP F, METALS												0
Aluminum	4					4					4	12
Arsenic	4		4	4	4	4	4	2	1	1	4	32
Barium	4	4		4	4	4					4	24
Beryllium	4			4	4	4					2	18
Boron	4			4	4	4					2	18
Cadmium	4	4	4	4	4	4	4		1	1	4	34
Calcium												0
Chromium (Total)	4	4	4	4	4	4	4		1	1	4	34
Copper	4	4	4	4	4	4	4		1	1	4	34
Iron	4	4	4	4	4	4	4		1	1	4	34
Lead	4	4	4	4	4	4	4		1	1	4	34
Magnesium												0
Manganese												0
Mercury	4	4	4	4	4	4	4		1	1	4	34
Nickel	4	4	4	4	4	4	4		1	1	4	34
Potassium												0
Selenium	4		4	4	4	4	4		1	1	4	30
Silver	4	4	4	4	4	4	4		1	1	4	34
Vanadium												0
Thallium												0
Zinc	4	4	4	4	4	4	4		1	1	4	34
												0
GROUP G												0
Acidity												0
Alkalinity												0
Alkalinity												0
Bromide												0
Residue, total	4	4	4	4	4	4	4	2	1	1	4	36
Residue, Filterable												0
Residue, Nonfilterable												0
Residue, Settleable												0
Residue, Volatile												0
Silica												0
Specific Conductance												0
Sulfate												0
Surfactants-MBAS												0
Turbidity												0
												0
EPA METHODS												0
601 Purgeable Halocarbon												0
602 Purgeable Aromatics												0
601/602	3	4	4	3	3	3	4	2	1	1	4	32
608 Pesticides and PCB's	3			3	3	3		2			2	16
608 Modified PCB's only												0
624/625 BNA's TTO's	1			1	1	1						4
Total Site Analytes	107	72	76	103	103	107	76	22	19	19	92	796

APPENDIX C

SAMPLING LOCATION MAP

N C AIR NATIONAL GUARD, CHARLOTTE NC
WASTE WATER CHARACTERIZATION SURVEY

CONDUCTED 1 - 10 MARCH 1994. PERFORMED BY ARMSTRONG LABORATORY WATER QUALITY BRANCH (AL/EQW) BROOKS AIR FORCE BASE, TEXAS.
PROJECT ENGINEER: CAPTAIN CHRISTOPHER WILLISTON



REVISIONS		
REV. NO.	DESCRIPTION	DATE
1	REMOVED BUILDINGS 10,11,12,14,15. ABANDONED IN PLACE SS	17 JUL 98
2	REVISE FOR NEW RAMP	22 JUL 91
3	REVISE FOR NEW HANGER	20NOV91
4	REVISED ADDING ENGINE TEST FACILITY	15 JUL 92
5	REVISED ADD FIRE TRAINING FACILITY	28AUG92

EXSISTING SANITARY SEWER SYSTEM PIPE SIZE, GRADE, & CAPACITY TABLE

M.H.	RIM. ELEV.	INV. IN.	INV. OUT	LENGTH FT.	GRADE(%)	PIPE SZ.	PIPE MAT'L	CAPACITY (CFS)	PEAK FLOW (CFS)
A	725.02	704.52	704.12	110	1.36	8"	VCP	1.40	.36
B	723.65	706.18	706.08	260	0.50	8"	VCP	0.88	.28
C	715.17	707.08	707.02	107	0.29	8"	VCP	1.04	.28
D	716.34	707.98	707.88	288	0.31	8"	VCP	0.97	.18
E	711.56	708.99	708.99	118	0.98	8"	VCP	0.85	.82
F	711.38	708.13	708.13						
G	888.85	886.46	885.36	130	0.82	8"	VCP	0.84	.36
H	708.61	887.48	887.48	148	0.58	8"	VCP	0.80	.28
I	715.10	708.61	888.53	34	7.88	8"	VCP	2.33	.36
J	721.92	713.23	713.52	46	2.73	8"	VCP	1.50	.34
K	725.83	716.08	716.03	373	0.38	8"	VCP	0.71	.11
L	721.38	717.73	717.33	42.3	0.11	8"	VCP	0.38	.09
M	721.98	717.38	717.28	192	0.81	8"	VCP	1.05	.25
N	722.88	718.48	718.38	265	2.32	8"	VCP	1.92	.82
O	728.19		725.13						
A	725.03	704.52	704.12	176	4.31	8"	VCP	1.62	.81
A-1	724.98	711.84	711.84						
B	723.65	706.15	706.05	148	8.56	8"	VCP	3.70	.87
B-1	726.36	710.48	710.28	182	3.01	8"	VCP	2.18	.87
B-2	733.51	727.15	727.01	105	0.065	8"	VCP	0.37	.87
B-3	731.84	727.31	727.25						
B	723.65	706.30	706.05	80	11.2	8"	VCP	4.33	.04
B-4	727.83		715.87						
D	714.34	706.30	707.86	80	1.61	8"	VCP	2.33	.04
D-1	717.73	711.95	711.75	35	4.15	8"	VCP	2.96	.04
D-2	726.82	713.33	713.08	57	16.53	8"	VCP	3.26	.04
D-3	734.48		720.45						
D-1	717.73	715.82	715.75	108	4.65	8"	VCP	2.88	.04
D-1-1	724.18	717.87	717.37	42	4.80	8"	VCP	2.88	.04
D-1-2	728.04		719.83						
E	711.55	708.08	708.08	73.4	7.83	8"	VCP	3.85	.18
E-1	714.81	711.21	711.29	48.8	11.20	8"	VCP	4.30	.18
E-2	721.00	716.01	716.31						
G	688.89	686.48	686.38	?	?	?	?	?	?
G-1	?	?	?						
J	725.83	717.68	718.53	126	0.83	8"	VCP	1.17	.04
J-1	728.42		718.79						
K	725.83	718.80	718.63	118.6	8.43	8"	VCP	3.88	.806
K-1	725.83		722.34						
SS-1AA	672.85	668.2	665						
SS-1A	684.2	678.8	678.7	307	3.11	6"	PVC		
SS-1B	681.2	683.6	678.4	75	.47	6"	PVC		
SS-1C	683.0	668.1	667.8	122	2.98	6"	PVC		
SS-1D	680.8	680.2	680.1	190	1.08	6"	PVC		
SS-1E	704.2	684.1	684.2	298	2.98	6"	PVC		
SS-1F	708.8	?	701.8	286	1.75	6"	PVC		
SS-2A	684.8	680.8	680.8	61 TO SS-1C	1.62	6"	PVC		
SS-2B	704.8	684.8	684.8	200	3.50	6"	PVC		
SS-2C	710.8	?	710.8	110	0.64	6"	PVC		
SS-2D	711.2	?	701	260	4.00 FORCE MAIN	4"	PVC		
SS-2E	702.3	684.3	684	330	1.9	6"	PVC		
SS-2F	730.8	726.8	723.9	400	1.9	6"	PVC		
SS-3A	707.0	703.1	?	300	2.7	6"			
SS-3B	726.0	711.3	?	210	2.8	6"			
SS-3C	726.5	717.1	?	115	.7	6"			
SS-3D	726.87	717.8	?	30	?	6"			
SS-3E	727.8	718.01	?	250	1.8	6"	CI		

OIL WATER SEPERATORS			
#	FACILITY	BLDG #	HOLDING TANK CAPACITY
1	OIL WATER SEPERATOR	4	500 GALLONS
2	OIL WATER SEPERATOR	3	650 GALLONS
3	OIL WATER SEPERATORS	18	750 GALLONS
4	OIL WATER SEPERATORS	17	5000 GALLONS
5	OIL WATER SEPERATORS	18	750 GALLONS
6	OIL WATER SEPERATORS	22	750 GALLONS
7	OIL WATER SEPERATORS	POL	8000 GALLONS
8	OIL WATER SEPERATOR	40	200 GALLONS
9	OIL WATER SEPERATOR	45	550 GALLONS
10	OIL WATER SEPERATOR	51	300 GALLONS
11	OIL WATER SEPERATOR	ENGINE TEST	500 GALLONS

NOTE: POL ALSO HAS A 5,000 GALLON OIL STORAGE TANK

LEGEND
- OIL INTERCEPTER
- OIL-WATER SEPERATOR
- MANHOLE
- LIFT STATION
- VERIFIED
- UNVERIFIED

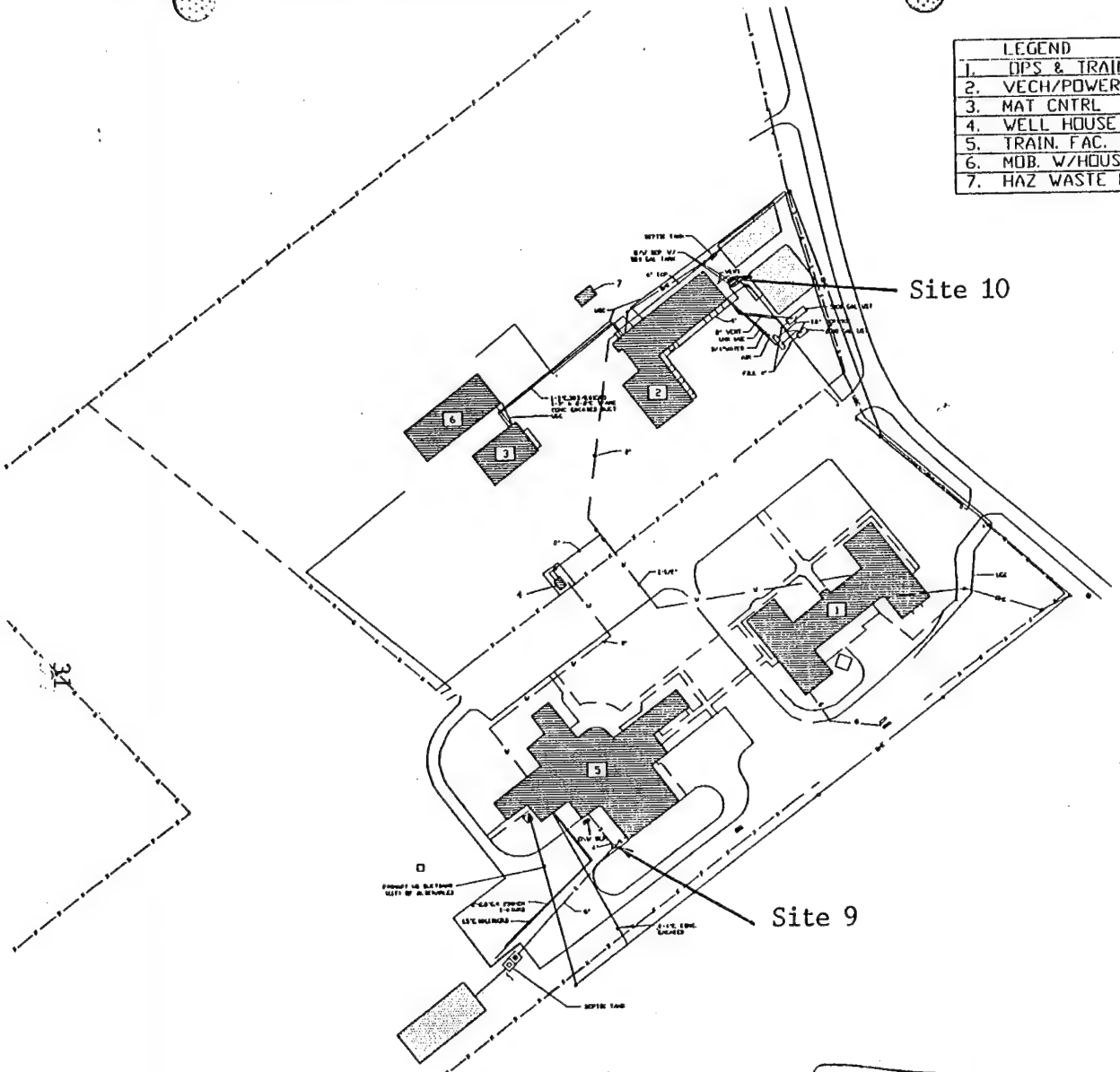
COMPREHENSIVE PLAN

SANITARY SEWAGE SYSTEM

NORTH CAROLINA AIR NATIONAL GUARD
145TH TACTICAL AIRLIFT GROUP
5225 MORRIS FIELD DRIVE
CHARLOTTE, NC. 28208-5797

F-2

30



LEGEND	FAC MGR PRI		ALT	
1. OPS & TRAIN	LANEY, RICKEY	2489	SWARINGER, KEN	2488
2. VECH/POWER PRO	RUSHING, JIM	2484	IRBY, RAY	2483
3. MAT CNTRL	TUCKER, JAMES	2485	MCCRAY, ALFONSO	2646
4. WELL HOUSE	HOLDER, BILLY	2486	IRBY, RAY	2483
5. TRAIN. FAC.	BROCK, JEFF	2470	STILLER, RITCHIE	2481
6. MOB. W/HOUSE	STILLER, RITCHIE	2481	LONEY. RICKEY	2489
7. HAZ WASTE PT.	IRBY, RAY	2483	RUSHING, JIM	2484

SYMBOL LEGEND

- OHE — OVERHEAD ELECTRICAL
- UGE — UNDERGROUND ELECTRICAL
- OHC — OVERHEAD COMMUNICATIONS
- UGC — UNDERGROUND COMMUNICATIONS
- G — G — PROPANE GAS DISTRIBUTION
- S — SEWER
- W — WATER DISTRIBUTION SYSTEM
- UST — UNDERGROUND STORAGE TANK
- DRAINAGE FIELD

Should have a detail map like this for each sample point showing facilities included for each

COMPREHENSIVE PLAN

UTILITY PLAN
BADIN ANG STATION

NORTH CAROLINA AIR NATIONAL GUARD
145TH TACTICAL AIRLIFT GROUP
5225 MORRIS FIELD DRIVE
CHARLOTTE NC 28208-5797

F-

APPENDIX D

ANALYTICAL RESULTS

TABLE DA-1, SITE 1, BASE INFLUENT FROM COMMERCIAL AC MAINTENANCE
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD
Survey Dates: 1 - 9 MARCH 1994
Contributing Sources: Commercial Off-Base Sanitary and Industrial Discharges

	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE
GROUP A ANALYTES (mg/L)	Friday, 04 Mar 94	Saturday, 05 Mar 94	DUPLICATE, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Ammonia	28.4	14.1	14	46	33.2
Kjeldahl Nitrogen	39	76	76	76	52
Nitrate	0.28	NR			Not requested
Chemical Oxygen Demand	278	1300	1480	1210	413
Oil and Grease	80	39.2	21.6	304	107.2
Total Petroleum Hydrocarbon	7.2	13.3	3.7	12.8	36.8
Total Phosphorus	8.2	5.6	5.4	11.6	10.8
GROUP D ANALYTES (mg/L)					
Cyanide	<.005	0.008	0.008	0.007	<0.005
GROUP E ANALYTES (ug/L)					
Phenols	20	50	68	92	103
GROUP F ANALYTES (mg/L)					
Aluminum	1.5	0.59	0.65	0.4	0.26
Arsenic	<0.05	<0.05	<0.05	<0.05	<0.05
Barium	0.03	0.02	0.03	0.02	0.02
Beryllium	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	0.07	<0.05	0.05	0.06	<0.05
Cadmium	0.002	0.001	0.002	<0.001	<0.001
Total Chromium	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	0.05	0.028	0.03	0.024	0.022
Iron	3.1	1.5	1.6	1.4	2.1
Lead	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	<0.005	<0.005	<0.005	0.008	<0.005
Selenium	<0.05	<0.05	<0.05	<0.05	<0.05
Silver	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	0.34	0.28	0.3	0.16	0.10
Group G (mg/L)					
Residue (total)	558	522	488	602	519
ON SITE ANALYSES					
pH (units)	6	6.9	6.9	6.4	6
Temperature (°C)	16	14	14	16	17
SAMPLE NUMBERS	GN940005	GN940030	GN940053	GN940055	GN940084
	GN940010	GN940029	GN940054	GN940056	GN940085
		COLLECTION DATE	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE
VOLATILE COMPOUNDS (ug/L)	Sample GN940006 broke.	Saturday, 05 Mar 94	Wednesday, 09 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Benzene		<1.0	<10.0	<1.0	<1.0
Bromodichloromethane		1.00	<10.0	<1.0	
Bromoform		<1.0	<10.0	<1.0	<1.0
Bromomethane		<1.0	<10.0	<1.0	<1.0
Carbon tetrachloride		<1.0	<10.0	<1.0	<1.0
Chlorobenzene		<1.0	<10.0	<1.0	<1.0
Chlorodibromomethane		<1.0	<10.0	<1.0	<1.0
Chloroethane		<1.0	<10.0	<1.0	<1.0
2-Chlorethylvinyl Ether		<1.0	<10.0	<1.0	<1.0
Chloroform		12.14	10.2	4.5	6.08
Chloromethane		<1.0	<10.0	<1.0	<1.0
1,2-Dichlorobenzene		10.17	<10.0	<1.0	2.76
1,3-Dichlorobenzene		<1.0	<10.0	<1.0	<1.0
1,4-Dichlorobenzene		<1.0	<10.0	<1.0	<1.0
Dichlorodifluoromethane		<1.0	<10.0	<1.0	<1.0
1,1-Dichloroethane		<1.0	<10.0	<1.0	<1.0
1,2-Dichloroethane		<1.0	<10.0	<1.0	<1.0
1,1-Dichloroethene		<1.0	<10.0	<1.0	<1.0
Cis-1,2-Dichloroethene		NR	NR	NR	NR
Trans-1,2-Dichloroethene		<1.0	<10.0	<1.0	<1.0
1,2-Dichloropropane		<1.0	<10.0	NR	NR
Cis-1,3-Dichloropropene		<1.0	<10.0	<1.0	<1.0
Trans-1,3-Dichloropropene		<1.0	<10.0	<1.0	<1.0
Ethyl Benzene		<1.0	<10.0	<1.0	<1.0
Methylene Chloride		<1.0	<10.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane		<1.0	<10.0	<1.0	<1.0
Tetrachloroethylene		2.61	<10.0	<1.0	<1.0
Toluene		<1.0	<10.0	<1.0	<1.0
1,1,1-Trichloroethane		<1.0	<10.0	<1.0	<1.0
1,1,2-Trichloroethane		<1.0	<10.0	<1.0	<1.0
Trichloroethylene		<1.0	<10.0	<1.0	<1.0
Trichlorofluoromethane		<1.0	<10.0	<1.0	<1.0
Vinyl Chloride		<1.0	<10.0	<1.0	<1.0
o-Xylene		<1.0	<10.0	<1.0	<1.0
m-Xylene		<1.0	<10.0	<1.0	<1.0
p-Xylene		GN940031	GN940107	GN940055	GN940086
SAMPLE NUMBER					

TABLE DA-2, SITE 1, BASE INFLUENT FROM COMMERCIAL AC MAINTENANCE
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD
Survey Dates: 1 - 9 MARCH 1994
Contributing Sources: Off-Base Sanitary and Industrial Discharge

Total Toxic Organics 624 & 625 (ug/L)	COLLECTION DATE	Total Toxic Organics 624 & 625 (ug/L)	COLLECTION DATE
Volatile Compounds	Sunday, 06 Mar 94	Base Neutral Compounds (ug/L)	
Benzene	<5.0	Acenaphthene	<10.0
Bromodichloromethane	<5.0	Acenaphthylene	<10.0
Bromoform	<5.0	Anthracene	<10.0
Bromomethane	<10.0	Benzo(a)anthracene	<10.0
Carbon tetrachloride	<5.0	Benzo(b)fluoranthene	<10.0
Chlorobenzene	<5.0	Benzo(a)pyrene	<10.0
Chloroethane	<10.0	Benzo(k)fluoranthene	<10.0
2-Chloroethyvinylether	<10.0	Benzo(g,h,i,)perylene	<10.0
Chloroform	6	Bis(2-chloroethyl)ether	<10.0
Chloromethane	<10.0	Bis(2-chloroethoxy)methane	<10.0
Dibromochloromethane	<5.0	Bis(2-chloroisopropal)ether	<10.0
1,2-Dichlorobenzene	<5.0	Bis(2-ethylhexyl)phthalate	30
1,3-Dichlorobenzene	<5.0	4-Bromophenyl-phenlether	<10.0
1,4-Dichlorobenzene	<5.0	Butylbenzylphthalate	<10.0
1,1-Dichloroethane	<5.0	Chlordane	NP
1,2-Dichloroethane	<5.0	2-Chloronaphthalene	<10.0
1,1-Dichloroethene	<5.0	4-Chlorophenyl-phenyl ether	<10.0
cis-1,2-Dichloroethene	<5.0	Chrysene	<10.0
Trans-1,2-Dichloroethene	<5.0	Dibenzo, anthracene	<10.0
1,2-Dichloropropane	<5.0	Di-n-butlylphthalate	<10.0
Cis-1,3-Dichloropropene	<5.0	1,2-Dichlorobenzene	<10.0
Trans-1,3-Dichloropropene	<5.0	1,3-Dichlorobenzene	<10.0
Ethylbenzene	<5.0	1,4-Dichlorobenzene	<10.0
Methylene Chloride	<5.0	3,3'-Dichlorobenzidine	<20.0
1,1,2,2-Tetrachloroethane	<5.0	Diethylphthalate	70
Tetrachloroethene	<5.0	Dimethyl phthalate	<10.0
Toluene	<5.0	2,4-Dinitrotoluene	<10.0
1,1,1-Trichloroethane	<5.0	2,6-Dinitrotoluene	<10.0
1,1,2-Trichloroethane	<5.0	Di-n-octylphthalate	<10.0
Trichloroethylene	<5.0	Fluoranthene	<10.0
Trichlorofluoromethane	<50.0	Fluorene	<10.0
Vinyl Chloride	<10.0	Hexachlorobenzene	<10.0
o-Xylene	<1.0	Hexachlorobutadiene	<10.0
m-Xylene	<1.0	Hexachlorocyclopentadiene	<10.0
p-Xylene	<1.0	Hexachloroethane	<10.0
		Indeno(1,2,3-cd)pyrene	<10.0
	COLLECTION DATE	Isophorone	<10.0
PCB's & PESTICIDES (ug/L)	Sunday, 06 Mar 94	Naphthalene	<10.0
Alpha-BHC	<0.05	Nitrobenzene	<10.0
Beta-BHC	<0.05	N-Nitroso dimethyl amine	<10.0
Delta-BHC	<0.05		
Lindane	<0.05	N-Nitroso-di-n-propylamine	<10.0
Heptachlor	<0.05	N-Nitrosodiphenylamine	<10.0
Aldrin	<0.05	Phenanthrene	<10.0
Heptachlor Epoxide	<0.05	Pyrene	<10.0
Endosulfan I	<0.05	1,2,4-Trichlorobenzene	<10.0
Dieldrin	<0.10	Toxaphene	<5.0
4,4' DDE	<0.10		
Endrin	<0.10	Acid Compounds (ug/L)	
Endosulfan II	<0.10	P-Chloro-m-cresol	<10.0
4,4' DDD	<0.10	2-Chorophenol	<10.0
Endosulfan Sulfate	<0.10	2,4-Dichorophenol	<10.0
4,4-DDT (p,p-DDT)	<0.20	2,4-Dimethylphenol	<10.0
Endrin Ketone	<0.10	2,4-Dinitrophenol	<50.0
Methoxychlor	<0.50	4,6-Dinitro-2-methylphenol	<50.0
Chlordane	NP	2-Nitrophenol	<10.0
Alpha-Chlorodane	<0.05	4-Nitrophenol	<50.0
Gamma-Chlorodane	<0.05	Pentachlorophenol	<50.0
Toxaphene	<5	Phenol	20
Endrin Aldehyde	<0.10	2,4,6-Trichlorophenol	<10.0
Arochlor 1016	<1		
Arochlor 1221	<2	Sample Number	GN940057
Arochlor 1232	<1		CN940058
Arochlor 1242	<1		
Arochlor 1248	<1		
Arochlor 1254	<1		
Arochlor 1260	<1		
SAMPLE NUMBER	CN940058		

TABLE DA-3, SITE 1, BASE INFLUENT FROM COMMERCIAL AC MAINTENANCE
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD
Survey Dates: 1 - 9 MARCH 1994
Contributing Sources: Commercial Off-Base Sanitary and Industrial Discharges

	COLLECTION DATE
PCB's & PESTICIDES (ug/L)	Sunday, 06 Mar 94
Alpha-BHC	<0.05
Beta-BHC	<0.05
Delta-BHC	<0.05
Lindane	<0.05
Heptachlor	<0.05
Aldrin	<0.05
Heptachlor Epoxide	<0.05
Endosulfan I	<0.05
Dieldrin	<0.10
4,4' DDE	<0.10
Endrin	<0.10
Endosulfan II	<0.10
4,4' DDD	<0.10
Endosulfan Sulfate	<0.10
4,4-DDT	<0.10
Endrin Ketone	<0.10
Methoxychlor	<0.10
Chlordane	NA
Alpha-Chlorodane	<0.05
Gamma-Chlorodane	<0.05
Toxaphene	<5
Endrin Aldehyde	<0.10
Arochlor 1016	<1
Arochlor 1221	<2
Arochlor 1232	<1
Arochlor 1242	<1
Arochlor 1248	<1
Arochlor 1254	<1
Arochlor 1260	NA

TABLE DB-1, SITE 2, OPERATIONS DISCHARGE
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1-9 March 1994
Contributing Sources: Buildings 2, 3, 4, & 5 Discharges

	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE
GROUP A ANALYTES (mg/L)	Friday, 04 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Ammonia	60	71	95	95
Kjeldahl Nitrogen (total)	72	68	96	92
Chemical Oxygen Demand	183	279	Not requested	Not requested
Oil and Grease	10	23.2	30.4	176
Total Petroleum Hydrocarbon	1.6	3.5	0.8	38.4
Total Phosphorus	15.2	14.8	Not requested	Not requested
Group D ANALYTES (mg/L)				
Cyanide	0.005	0.008	0.011	0.007
Group E ANALYTES (ug/L)				
Phenols	53	23	68	100
GROUP F ANALYTES (mg/L)				
Barium	0.04	0.04	0.02	0.02
Cadmium	<0.001	<0.001	<0.001	<0.001
Total Chromium	<0.005	<0.005	<0.005	<0.005
Copper	0.034	0.043	0.026	0.023
Iron	3	1.9	1	1.5
Lead	<0.02	<0.02	<0.02	0.07
Mercury	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	<0.005	<0.005	<0.005	<0.005
Silver	<0.005	<0.005	<0.005	<0.005
Zinc	0.15	0.24	0.16	0.12
Group G (mg/L)				
Residue (total)	548	541	425	617
ON SITE ANALYSES				
pH (units)	6	7	7	6.5
Temperature (°C)	14	15	14	16
SAMPLE NUMBERS	CN940007	CN940032	GN940059	GN940087
	GN940008	CN940033	GN940060	CN940088
	GN940009	GN931034	GN940061	GN940089
VOLATILE COMPOUNDS (ug/L)	Friday, 04 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Saturday, 05 Mar 94
Benzene	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	<1.0	<1.0	<1.0	<1.0
Bromoform	<1.0	<1.0	<1.0	<1.0
Bromomethane	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	<1.0	<1.0	<1.0	<1.0
Chloroethane	<1.0	<1.0	<1.0	<1.0
2-Chloroethyvinylether	<1.0	<1.0	<1.0	<1.0
Chloroform	2.16	3.97	9.04	2.18
Chloromethane	<1.0	<1.0	<1.0	<1.0
Chlorodibromomethane	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	5.7	1.93	5.11	9.44
1,3-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0
1,4-Dichlorobenzene	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoromethane	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethane	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	<1.0	<1.0	<1.0	<1.0
Trans-1,2-Dichloroethene	<1.0	<1.0	<1.0	<1.0
1,2-Dichloropropane	<1.0	<1.0	<1.0	<1.0
Cis-1,3-Dichloropropene	<1.0	<1.0	<1.0	<1.0
Trans-1,3-Dichloropropene	<1.0	<1.0	<1.0	<1.0
Ethylbenzene	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	<1.0	<1.0	<1.0	<1.0
1,1,2,2-Tetrachloroethane	<1.0	<1.0	<1.0	<1.0
Tetrachloroethylene	<1.0	<1.0	<1.0	<1.0
Toluene	<1.0	<1.0	<1.0	<1.0
1,1,1-Trichloroethane	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	<1.0	<1.0	<1.0	<1.0
Trichloroethylene	<1.0	<1.0	<1.0	<1.0
Trichlorofluoromethane	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	<1.0	<1.0	<1.0	<1.0
m-Xylene	<1.0	<1.0	<1.0	<1.0
o-Xylene	<1.0	<1.0	<1.0	<1.0
p-Xylene	<1.0	<1.0	<1.0	<1.0
Large Quantities of Acetone and MIBK are Present in each VOA Sample				

TABLE DC-1, SITE 3, CLINIC, CAFETERIA, AND WASHRACK DISCHARGE
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1-9 March 1994
Contributing Sources: Buildings 1, 6, 17, 18, 20, 45, & 52 Discharges

	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE
GROUP A ANALYTES	Friday, 04 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Chemical Oxygen Demand (mg/L)	379	368	1640	2070
Oil and Grease (mg/L)	93.6	128	48	392
Total Petroleum Hydrocarbon (mg/L)	4.3	5.2	<.3	107.2
Total Phosphorus (mg/L)	14.4	7.4	14.4	1.6
GROUP D ANALYTES				
Cyanide	0.005	<.005	0.011	0.005
GROUP E ANALYTES				
Phenols (ug/L)	68	103	77	88
GROUP F ANALYTES				
Arsenic (mg/L)	<0.05	<0.05	<0.05	<0.05
Cadmium (mg/L)	<0.001	<0.001	0.018	0.23
Total Chromium (mg/L)	<0.005	<0.005	<0.005	0.023
Copper (mg/L)	0.054	0.063	0.053	0.21
Iron (mg/L)	4.3	4.2	2	1.3
Lead (mg/L)	<0.02	<0.02	<0.02	0.05
Mercury (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
Nickel (mg/L)	0.006	<0.005	0.008	0.025
Selenium	<0.05	<0.05	<0.05	<0.05
Silver (mg/L)	<0.005	0.11	<0.005	<0.005
Zinc (mg/L)	0.33	0.23	0.24	0.24
ON SITE ANALYSES				
pH (units)	6.2	6	5.4	7.2
Temperature (°C)	10	27	15	12
GROUP G ANALYTES				
Residue (total)	619	472	576	833
TSS				
SAMPLE NUMBERS	CN940011	GN940035	GN940062	GN940090
	GN940012	CN940036	CN940063	CN940091
	GN940013 (broken)	GN940037	GN940064	GN940092
	GN940108 replacement			
VOLATILE COMPOUNDS (ug/L)	Wednesday, 09 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Benzene	<10	<1.0	<1.0	<10
Bromodichloromethane	<10	<1.0	<1.0	<10
Bromoform	<10	<1.0	<1.0	<10
Bromomethane	<10	1.64	<1.0	<10
Carbon tetrachloride	<10	<1.0	<1.0	<10
Chlorobenzene	<10	1.17	<1.0	<10
Chloroethane	<10	<1.0	<1.0	<10
2-Chloroethyvinylether	<10	<1.0	<1.0	<10
Chloroform	<10	21.79	13.36	<10
Chloromethane	<10	<1.0	<1.0	<10
Chlorodibromomethane	<10	<1.0	<1.0	<10
1,2-Dichlorobenzene	616.2	1.89	3.24	<10
1,3-Dichlorobenzene	35.7	<1.0	<1.0	<10
1,4-Dichlorobenzene	51.5	<1.0	<1.0	<10
Dichlorodifluoromethane	<10	<1.0	<1.0	<10
1,1-Dichloroethane	<10	<1.0	<1.0	<10
1,2-Dichloroethane	<10	<1.0	<1.0	<10
1,1-Dichloroethene	<10	<1.0	<1.0	<10
Trans-1,2-Dichloroethene	<10	<1.0	<1.0	<10
1,2-Dichloropropane	<10	<1.0	<1.0	<10
Cis-1,3-Dichloropropene	<10	<1.0	<1.0	<10
Trans-1,3-Dichloropropene	<10	<1.0	<1.0	<10
Ethylbenzene	<10	<1.0	<1.0	<10
Methylene Chloride	<10	<1.0	<1.0	<10
1,1,2,2-Tetrachloroethane	<10	<1.0	<1.0	<10
Tetrachloroethene	<10	<1.0	<1.0	<10
Toluene	<10	28.35	12.56	<10
1,1,1-Trichloroethane	<10	<1.0	<1.0	<10
1,1,2-Trichloroethane	<10	<1.0	<1.0	<10
Trichloroethene	<10	<1.0	<1.0	<10
Trichlorofluoromethane	<10	<1.0	<1.0	<10
Vinyl Chloride	<10	<1.0	<1.0	<10
m-Xylene	<10	<1.0	<1.0	<10
o-Xylene	<10	<1.0	<1.0	<10
p-Xylene	Not reported	<1.0	<1.0	<10

TABLE DD-1, SITE 4, BASE SOUTH EAST EFFLUENT
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1-9 March 1994
Contributing Sources: Sites 1, 2, & 3 Sources

	COLLECTION DATE		COLLECTION DATE		COLLECTION DATE		COLLECTION DATE	
GROUP A ANALYTES	Friday, 04 Mar 94		Saturday, 05 Mar 94		Sunday, 06 Mar 94		Monday, 07 Mar 94	
Ammonia	51		36		71		43	
Biochemical Oxygen Demand (mg/L)	210		NR		608		99	
Kjeldahl Nitrogen(total)	53		45.5		82		72	
Chemical Oxygen Demand (mg/L)	163		203		1090		970	
Oil and Grease (mg/L)	92.8		92.8		64		256	
Total Petroleum Hydrocarbon (mg/L)	1.9		5.6		8		72	
Total Phosphorus (mg/L)	6.6		5		12.8		9.2	
GROUP D ANALYTES								
Cyanide	0.005		<.005		0.01		0.007	
GROUP E ANALYTES								
Phenols (ug/L)	28		21		60		68	
GROUP F ANALYTES								
Aluminum	0.45		0.22		0.72		0.28	
Arsenic (mg/L)	<0.05		<0.05		<0.05		<0.05	
Barium	0.02		0.01		0.03		0.02	
Beryllium (mg/L)	<0.005		<0.005		<0.005		<0.005	
Boron	<0.05		<0.05		<0.05		<0.05	
Cadmium	<0.001		<0.001		0.01		0.035	
Total Chromium (mg/L)	<0.005		<0.005		<0.005		<0.005	
Copper (mg/L)	0.024		0.03		0.047		0.051	
Iron (mg/L)	1.8		1.4		1.9		1.4	
Lead (mg/L)	<0.02		<0.02		0.02		<0.02	
Mercury (mg/L)	<0.0005		<0.0005		<0.0005		<0.0005	
Nickel (mg/L)	<0.005		<0.005		0.006		0.007	
Selenium	<0.05		<0.05		<0.05		<0.05	
Silver (mg/L)	<0.005		<0.005		<0.005		<0.005	
Zinc (mg/L)	0.12		0.09		0.21		0.13	
ON SITE ANALYSES								
pH (units)	6		6		6		7	
Temperature (°C)	27		12		16		12	
	Fatty O&G				Smelled of Citrikleen		O&G present and Citrikleen	
GROUP G ANALYTES								
Residue (total)	580		339		809		659	
TSS								
SAMPLE NUMBERS	GN940014		GN40038		GN940065		GN940093	
	GN940015		GN940039		GN940066		GN940094	
	GN940016		GN940040		GN940067		GN940095	
VOLATILE COMPOUNDS (ug/L)	Friday, 04 Mar 94		Saturday, 05 Mar 94		Sunday, 06 Mar 94 (624)		Monday, 07 Mar 94	
Benzene	<10		<1.0		<5		<1.0	
Bromodichloromethane	<10		<1.0		<5		<1.0	
Bromoform	<10		<1.0		<5		<1.0	
Bromomethane	<10		<1.0		<10		<1.0	
Carbon tetrachloride	<10		<1.0		<5		<1.0	
Chlorobenzene	<10		<1.0		<5		<1.0	
Chloroethane	<10		<1.0		<10		<1.0	
2-Chloroethyvinyl Ether	<10		<1.0		<10			2.36
Chloroform	29.9		14.96		11			2.83
Chloromethane	<10		<1.0		<10		<1.0	
Chlorodibromomethane	<10		<1.0		<5		<1.0	
1,2-Dichlorobenzene	<10		1.7		5			9.86
1,3-Dichlorobenzene	<10		<1.0		<5		<1.0	
1,4-Dichlorobenzene	<10		<1.0		<5		<1.0	
Dichlorodifluoromethane	<10		<1.0		<5		<1.0	
1,1-Dichloroethane	<10		<1.0		<5		<1.0	
1,2-Dichloroethane	<10		<1.0		<5		<1.0	
1,1-Dichloroethene	<10		<1.0		<5		<1.0	
Cis-1,2-Dichloroethene	NR		NR		<5		NR	
Trans-1,2-Dichloroethene	<10		<1.0		<5		<1.0	
1,2-Dichloropropane	<10		<1.0		<5		<1.0	
Cis-1,3-Dichloropropene	<10		<1.0		<5		<1.0	
Trans-1,3-Dichloropropene	<10		<1.0		<5		<1.0	
Ethylbenzene	<10		<1.0		<5		<1.0	
Methylene Chloride	<10		<1.0		<5		<1.0	
1,1,2,2-Tetrachloroethane	<10		<1.0		<5		<1.0	
Tetrachloroethylene	<10		<1.0		<5		<1.0	
Toluene	87		24.03		28			43.43
1,1,1-Trichloroethane	<10		<1.0		<5		<1.0	
1,1,2-Trichloroethane	<10		<1.0		<5		<1.0	
Trichloroethylene	<10		<1.0		<5		<1.0	
Trichlorofluoromethane	<10		<1.0		<50		<1.0	
Vinyl Chloride	<10		<1.0		<10		<1.0	
m-Xylene	<10		See Comment		Not reported		See Comment	
o-Xylene	<10		<1.0		Not reported			3.43
p-Xylene	<10		1.36		Not reported			6.11
m- and p-xylene coelute. p-xylene result is the sum of both analytes								

TABLE DD-2, SITE 4, SOUTH BASE EFFLUENT
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD
Survey Dates: 1 - 9 MARCH 1994
Contributing Sources: Sites 1, 2, & 3 Sources

Total Toxic Organics 624 & 625 (ug/L)	COLLECTION DATE	Total Toxic Organics 624 & 625 (ug/L)	COLLECTION DATE
Volatile Compounds	**Sunday, 06 Mar 94**	**Base Neutral Compounds (ug/L)**	
Benzene	<5.0	Acenaphthene	<10.0
Bromodichloromethane	<5.0	Acenaphthylene	<10.0
Bromoform	<5.0	Anthracene	<10.0
Bromomethane	<10.0	Benzo(a)anthracene	<10.0
Carbon tetrachloride	<5.0	Benzo(b)fluoranthene	<10.0
Chlorobenzene	<5.0	Benzo(a)pyrene	<10.0
Chloroethane	<10.0	Benzo(k)fluoranthene	<10.0
2-Chloroethyvinylether	<10.0	Benzo(g,h,i,)perylene	<10.0
Chloroform	11	Bis(2-chloroethyl)ether	<10.0
Chloromethane	<10.0	Bis(2-chloroethoxy)methane	<10.0
Dibromochloromethane	NR	Bis(2-chloroisopropal)ether	<10.0
1,2-Dichlorobenzene	5	Bis(2-ethylhexyl)phthalate	150
1,3-Dichlorobenzene	<5.0	4-Bromophenyl-phenlether	<10.0
1,4-Dichlorobenzene	<5.0	Butylbenzylphthalate	<10.0
1,1-Dichloroethane	<5.0	Chlordane	NP
1,2-Dichloroethane	<5.0	2-Chloronaphthalene	<10.0
1,1-Dichloroethene	<5.0	4-Chlorophenyl-phenylether	<10.0
cis-1,2-Dichloroethene	<5.0	Chrysene	<10.0
Trans-1,2-Dichloroethene	<5.0	Dibenzo (a,h)anthracene	<10.0
1,2-Dichloropropane	<5.0	Di-n-butlylphthalate	<10.0
Cis-1,3-Dichloropropene	<5.0	1,2-Dichlorobenzene	<10.0
Trans-1,3-Dichloropropene	<5.0	1,3-Dichlorobenzene	<10.0
Ethylbenzene	<5.0	1,4-Dichlorobenzene	<10.0
Methylene Chloride	<5.0	3,3'-Dichlorobenzidine	<20.0
1,1,2,2-Tetrachloroethane	<5.0	Diethylphthalate	<10.0
Tetrachloroethene	<5.0	Dimethyl phthalate	<10.0
Toluene	<5.0	2,4-Dinitrotoluene	<10.0
1,1,1-Trichloroethane	<5.0	2,6-Dinitrotoluene	<10.0
1,1,2-Trichloroethane	<5.0	Di-n-octylphthalate	<10.0
Trichloroethylene	<5.0	Fluoranthene	<10.0
Trichlorofluoromethane	<50.0	Fluorene	<10.0
Vinyl Chloride	<10.0	Hexachlorobenzene	<10.0
o-Xylene	<1.0	Hexachlorobutadiene	<10.0
m-Xylene	<1.0	Hexachlorocyclopentadiene	<10.0
p-Xylene	<1.0	Hexachloroethane	<10.0
		Indeno(1,2,3-cd)pyrene	<10.0
	COLLECTION DATE	Isophorone	<10.0
PCB's & PESTICIDES (ug/L)	Sunday, 06 Mar 94	Naphthalene	60
Alpha-BHC	<0.05	Nitrobenzene	<10.0
Beta-BHC	<0.05	N-Nitroso dimethyl amine	<10.0
Delta-BHC	<0.05		
Lindane	<0.05	N-Nitroso-di-n-propylamine	<10.0
Heptachlor	<0.05	N-Nitrosodiphenylamine	<10.0
Aldrin	<0.05	Phenanthrene	<10.0
Heptachlor Epoxide	<0.05	Pyrene	<10.0
Endosulfan I	<0.05	1,2,4-Trichlorobenzene	<10.0
Dieldrin	<0.10	Toxaphene	<5
4,4' DDE	<0.10		
Endrin	<0.10	**Acid Compounds (ug/L)**	
Endosulfan II	<0.10	P-Chloro-m-cresol	<10.0
4,4' DDD	<0.10	2-Chorophenol	<10.0
Endosulfan Sulfate	<0.10	2,4-Dichorophenol	<10.0
4,4-DDT	<0.20	2,4-Dimethylphenol	<10.0
Endrin Ketone	<0.10	2,4-Dinitrophenol	<50.0
Methoxychlor	<0.5	4,6-Dinitro-2-methylphenol	<50.0
Chlordane	NP	2-Nitrophenol	<10.0
Alpha-Chlorodane	<0.05	4-Nitrophenol	<50.0
Gamma-Chlorodane	<0.05	Pentachlorophenol	<50.0
Toxaphene	<5	Phenol	<10.0
Endrin Aldehyde	<0.10	2,4,6-Trichlorophenol	<10.0
Arochlor 1016	<1		
Arochlor 1221	<2	**Sample Number**	GN940067
Arochlor 1232	<1		CN940068
Arochlor 1242	<1		
Arochlor 1248	<1		
Arochlor 1254	<1		
Arochlor 1260	<1		
SAMPLE NUMBER	CN940068		

TABLE DE-1, SITE 5, EAST BASE EFFLUENT
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994
Contributing Sources: Buildings 7, 22, 23, & 51

	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE
GROUP A ANALYTES	Friday, 04 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Ammonia	14	46	18	94
Biochemical Oxygen Demand (mg/L)	145	Not Collected	588	311
Kjeldahl Nitrogen(total)	24	74	78	120
Chemical Oxygen Demand (mg/L)	152	1130	168	900
Oil and Grease (mg/L)	18.4	25.6	72	88
Total Petroleum Hydrocarbon (mg/L)	18.4	2.6	72	49.6
Total Phosphorus (mg/L)	3.6	16.8	5.6	6
GROUP D ANALYTES				
Cyanide	<.005	0.01	<.005	<.005
GROUP E ANALYTES				
Phenols (ug/L)	25	78	45	18
GROUP F ANALYTES				
Aluminum	NR	0.97	NR	NR
Arsenic (mg/L)	NR	<0.05	<0.05	<0.05
Barium	0.02	0.04	<0.01	0.03
Beryllium (mg/L)	<0.005	<0.005	<0.005	<0.005
Boron	0.39	1.3	0.23	2.8
Cadmium	0.013	0.017	<0.001	0.015
Total Chromium (mg/L)	<0.005	0.033	<0.005	0.015
Copper (mg/L)	0.03	0.05	0.006	0.26
Iron (mg/L)	2.5	2.1	0.33	7.8
Lead (mg/L)	<0.02	<0.02	<0.02	<0.02
Mercury (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
Nickel (mg/L)	<0.005	<0.005	<0.005	<0.005
Selenium	<0.05	<0.05	<0.05	<0.05
Silver (mg/L)	<0.005	<0.005	<0.005	0.01
Zinc (mg/L)	0.09	0.29	0.03	0.08
ON SITE ANALYSES				
pH (units)	6.2	6	6.4	6.2
Temperature (°C)	13	14	14	16
GROUP G ANALYTES				
Residue (total) mg/L	785	369	284	812
SAMPLE NUMBERS	GN940017	GN940041	GN940069	GN940096
	GN940018	GN940042	GN940070	GN940097
	GN940019 VOA Broken	GN940043		GN940098
	GN940109			
VOLATILE COMPOUNDS (ug/L)	Resampled on Wed. 9 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Benzene	<10	<1.0	See TTO Sheet for VOA's	<1.0
Bromodichloromethane	<10	<1.0		<1.0
Bromoform	<10	<1.0		<1.0
Bromomethane	<10	<1.0		<1.0
Carbon tetrachloride	<10	<1.0		<1.0
Chlorobenzene	<10	<1.0		<1.0
Chloroethane	<10	<1.0		<1.0
2-Chloroethyvinyl Ether	<10	<1.0		<1.0
Chloroform	18.3	7.41		5.32
Chloromethane	<10	<1.0		<1.0
Chlorodibromomethane	<10	<1.0		<1.0
1,2-Dichlorobenzene	<10	<1.0		<1.0
1,3-Dichlorobenzene	<10	<1.0		<1.0
1,4-Dichlorobenzene	<10	<1.0		<1.0
Dichlorodifluoromethane	<10	<1.0		<1.0
1,1-Dichloroethane	<10	<1.0		<1.0
1,2-Dichloroethane	<10	<1.0		<1.0
1,1-Dichloroethene	<10	<1.0		<1.0
Trans-1,2-Dichloroethene	<10	<1.0		<1.0
1,2-Dichloropropane	<10	<1.0		<1.0
Cis-1,3-Dichloropropene	<10	<1.0		<1.0
Trans-1,3-Dichloropropene	<10	<1.0		<1.0
Ethylbenzene	<10	<1.0		<1.0
Methylene Chloride	<10	<1.0		<1.0
1,1,2,2-Tetrachloroethane	<10	<1.0		<1.0
Tetrachloroethylene	<10	<1.0		<1.0
Toluene	<10	<1.0		1.58
1,1,1-Trichloroethane	<10	<1.0		<1.0
1,1,2-Trichloroethane	<10	<1.0		<1.0
Trichloroethylene	<10	<1.0		<1.0
Trichlorofluoromethane	<10	<1.0		<1.0
Vinyl Chloride	<10	2.71		<1.0
m-Xylene	<10	** See Comment		** See Comment
o-Xylene	<10	1.95		1.1
p-Xylene	<10	1.64		1.22

** m- and p-xylene coelute. p-xylene result is sum of both analytes.

TABLE DE-2, SITE 5, EAST BASE EFFLUENT
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD
Survey Dates: 1 - 9 MARCH 1994
Contributing Sources: Buildings 7, 22, 23 & 51

Total Toxic Organics 624 & 625 (ug/L)	COLLECTION DATE	Total Toxic Organics 624 & 625 (ug/L)	COLLECTION DATE
Volatile Compounds	Sunday, 06 Mar 94	Base Neutral Compounds (ug/L)	
Benzene	<5.0	Acenaphthene	<10.0
Bromodichloromethane	<5.0	Acenaphthylene	<10.0
Bromoform	<5.0	Anthracene	<10.0
Bromomethane	<10.0	Benzo(a)anthracene	<10.0
Carbon tetrachloride	<5.0	Benzo(b)fluoranthene	<10.0
Chlorobenzene	<5.0	Benzo(a)pyrene	<10.0
Chloroethane	<10.0	Benzo(k)fluoroanthane	<10.0
2-Chloroethyvinylether	<10.0	Benzo(g,h,i,)perylene	<10.0
Chloroform	11	Bis(2-chloroethyl)ether	<10.0
Chloromethane	<10.0	Bis(2-chloroethoxy)methane	<10.0
Dibromochloromethane	NR	Bis(2-chloroisopropal)ether	<10.0
1,2-Dichlorobenzene	<5.0	Bis(2-ethylhexyl)phthalate	<10.0
1,3-Dichlorobenzene	<5.0	4-Bromophenyl-phenlether	<10.0
1,4-Dichlorobenzene	<5.0	Butylbenzylphthalate	<10.0
1,1-Dichloroethane	<5.0	Chlordane	NP
1,2-Dichloroethane	<5.0	2-Chloronaphthalene	<10.0
1,1-Dichloroethene	<5.0	4-Chlorophenyl-phenylether	<10.0
cis-1,2-Dichloroethene	<5.0	Chrysene	<10.0
Trans-1,2-Dichloroethene	<5.0	Dibenzoa,hanthracene	<10.0
1,2-Dichloropropane	<5.0	Di-n-butlphthalate	<10.0
Cis-1,3-Dichloropropene	<5.0	1,2-Dichlorobenzene	<10.0
Trans-1,3-Dichloropropene	<5.0	1,3-Dichlorobenzene	<10.0
Ethylbenzene	<5.0	1,4-Dichlorobenzene	<10.0
Methylene Chloride	<5.0	3,3'-Dichlorobenzidine	<20.0
1,1,2,2-Tetrachloroethane	<5.0	Diethylphthalate	<10.0
Tetrachloroethene	<5.0	Dimethyl phthalate	<10.0
Toluene	<5.0	2,4-Dinitrotoluene	<10.0
1,1,1-Trichloroethane	<5.0	2,6-Dinitrotoluene	<10.0
1,1,2-Trichloroethane	<5.0	Di-n-octylphthalate	<10.0
Trichloroethylene	<5.0	Fluoranthene	<10.0
Trichlorofluoromethane	<50.0	Fluorene	<10.0
Vinyl Chloride	<10.0	Hexachlorobenzene	<10.0
o-Xylene	<1.0	Hexachlorobutadiene	<10.0
m-Xylene	<1.0	Hexachlorocyclopentadiene	<10.0
p-Xylene	<1.0	Hexachloroethane	<10.0
		Indeno(1,2,3-cd)pyrene	<10.0
	COLLECTION DATE	Isophorone	<10.0
PCB's & PESTICIDES (ug/L)	Sunday, 06 Mar 94	Naphthalene	<10.0
Alpha-BHC	<0.05	Nitrobenzene	<10.0
Beta-BHC	<0.05	N-Nitroso dimethyl amine	<10.0
Delta-BHC	<0.05		
Lindane	<0.05	N-Nitroso-di-n-propylamine	<10.0
Heptachlor	<0.05	N-Nitrosodiphenylamine	<10.0
Aldrin	<0.05	Phenanthrene	<10.0
Heptachlor Epoxide	<0.05	Pyrene	<10.0
Endosulfan I	<0.05	1,2,4-Trichlorobenzene	<10.0
Dieldrin	<0.10	Toxaphene	<5.0
4,4' DDE	<0.10		
Endrin	<0.10	Acid Compounds (ug/L)	
Endosulfan II	<0.10	P-Chloro-m-cresol	<10.0
4,4' DDD	<0.10	2-Chorophenol	<10.0
Endosulfan Sulfate	<0.10	2,4-Dichorophenol	<10.0
4,4-DDT	<0.20	2,4-Dimethylphenol	<10.0
Endrin Ketone	<0.10	2,4-Dinitrophenol	<50.0
Methoxychlor	<0.5	4,6-Dinitro-2-methylphenol	<50.0
Chlordane	NP	2-Nitrophenol	<10.0
Alpha-Chlorodane	<0.05	4-Nitrophenol	<50.0
Gamma-Chlorodane	<0.05	Pentachlorophenol	<50.0
Toxaphene	<5	Phenol	<10.0
Endrin Aldehyde	<0.10	2,4,6-Trichlorophenol	<10.0
Arochlor 1016	<1		
Arochlor 1221	<2	Sample Number	GN940071
Arochlor 1232	<1		CN940072
Arochlor 1242	<1		
Arochlor 1248	<1		
Arochlor 1254	<1		
Arochlor 1260	<1		
SAMPLE NUMBER	CN940072		

TABLE DF-1, SITE 6, NORTH BASE EFFLUENT
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994
Contributing Sources: Buildings 16, 43, 49, 51, POL, and Engine Test Cell

	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE
GROUP A ANALYTES	Friday, 04 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Ammonia	42	52	116	97
Kjeldahl Nitrogen(total)	48.5	68	240	110
Biochemical Oxygen Demand (mg/L)	409	Not Collected	Not Collected	291
Chemical Oxygen Demand (mg/L)	192	1290	1160	980
Oil and Grease (mg/L)	58.4	30.4	232	192
Total Petroleum Hydrocarbon (mg/L)	32	6	123.2	60.8
Total Phosphorus (mg/L)	8	12		16.2
GROUP D ANALYTES				
Cyanide	0.005	0.007	0.017	0.008
GROUP E ANALYTES				
Phenols (ug/L)	43	57	233	175
GROUP F ANALYTES				
Aluminum	2.3	1.4	0.94	0.28
Arsenic (mg/L)	<0.05	<0.05	>0.05	<0.05
Barium	0.03	0.03	0.03	0.02
Beryllium (mg/L)	<0.005	<0.005	<0.005	<0.005
Boron	0.06	0.06	0.07	0.24
Cadmium (mg/L)	0.007	0.011	0.006	0.005
Total Chromium (mg/L)	0.007	0.007	<0.005	0.006
Copper (mg/L)	0.044	0.057	0.04	0.031
Iron (mg/L)	3.1	2.7	1.4	1.8
Lead (mg/L)	<0.02	0.02	<0.02	<0.02
Mercury (mg/L)	<0.0005	<0.0005	<0.0005	<0.0005
Nickel (mg/L)	<0.005	0.006	<0.005	<0.005
Selenium	<0.05	<0.05	<0.05	<0.05
Silver (mg/L)	<0.005	<0.005	<0.005	<0.005
Zinc (mg/L)	0.18	0.23	0.18	0.16
ON SITE ANALYSES				
pH (units)	6.5	6.4	7.8	6.4
Temperature (°C)	10	12	16	12
				Visible Sheen, Petroleum Odor
GROUP G ANALYTES				
Residue (total)	2384	1254	649	832
SAMPLE NUMBERS	CN940020	GN940044	GN940073	GN940099
	GN940021	CN940045	CN940074	CN940100
	GN940022 Broken	GN940046	GN940075	GN940101
	GN940110 Replacement			
VOLATILE COMPOUNDS (ug/L)	Wednesday, 09 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94 (624)	Monday, 07 Mar 94
Benzene	61.5	<1.0	<5	323.7
Bromodichloromethane	<10	<1.0	<5	<1.0
Bromoform	<10	<1.0	<5	<1.0
Bromomethane	<10	<1.0	<10	<1.0
Carbon tetrachloride	<10	<1.0	<5	<1.0
Chlorobenzene	<10	<1.0	<5	<1.0
Chloroethane	<10	<1.0	<10	<1.0
2-Chloroethyvinylether	<10	<1.0	<10	<1.0
Chloroform	18.4	3.88	7	3.77
Chloromethane	<10	<1.0	<10	<1.0
Chlorodibromomethane	<10	<1.0	<5	<1.0
1,2-Dichlorobenzene	<10	<1.0	<5	4.24
1,3-Dichlorobenzene	<10	<1.0	<5	<1.0
1,4-Dichlorobenzene	<10	<1.0	<5	<1.0
Dichlorodifluoromethane	<10	<1.0	<5	<1.0
1,1-Dichloroethane	<10	<1.0	<5	<1.0
1,2-Dichloroethane	<10	<1.0	<5	<1.0
1,1-Dichloroethene	<10	<1.0	<5	<1.0
Trans-1,2-Dichloroethene	<10	<1.0	<5	<1.0
1,2-Dichloropropane	<10	<1.0	<5	<1.0
Cis-1,3-Dichloropropene	<10	<1.0	<5	<1.0
Trans-1,3-Dichloropropene	<10	<1.0	<5	<1.0
Ethylbenzene	<10	<1.0	<5	58.3
Methylene Chloride	<10	<1.0	<5	<1.0
1,1,2,2-Tetrachloroethane	<10	<1.0	<5	<1.0
Tetrachloroethylene	<10	<1.0	<5	<1.0
Toluene	26.9	<1.0	<5	518.4
1,1,1-Trichloroethane	<10	<1.0	<5	<1.0
1,1,2-Trichloroethane	<10	<1.0	<5	<1.0
Trichloroethylene	<10	<1.0	<5	<1.0
Trichlorofluoromethane	<10	<1.0	<50	<1.0
Vinyl Chloride	<10	<1.0	<10	<1.0
m-Xylene	** See Comment	** See Comment	<5	**
o-Xylene	239.3	<1.0	<5	315.6
p-Xylene	97.6	1.32	<5	409.1
** - m- and p-xylene coelute. p-xylene result is sum of both				

TABLE DF-2, SITE 6, NORTH BASE EFFLUENT
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD
Survey Dates: 1 - 9 MARCH 1994
Contributing Sources: Buildings 7, 22, 23 & 51

Total Toxic Organics 624 & 625 (ug/L)	COLLECTION DATE	Total Toxic Organics 624 & 625 (ug/L)	COLLECTION DATE
Volatile Compounds	**Sunday, 06 Mar 94**	**Base Neutral Compounds (ug/L)**	**Sunday, 06 Mar 94**
Benzene	<5.0	Acenapthene	<60
Bromodichloromethane	<5.0	Acenaphthylene	<60
Bromoform	<5.0	Anthracene	<60
Bromomethane	<10.0	Benzo(a)anthracene	<60
Carbon tetrachloride	<5.0	Benzo(b)fluoranthene	<60
Chlorobenzene	<5.0	Benzo(a)pyrene	<60
Chloroethane	<10.0	Benzo(k)fluoroanthene	<60
2-Chloroethyvinylether	<10.0	Benzo(g,h,i,)perylene	<60
Chloroform	7	Bis(2-chloroethyl)ether	<60
Chloromethane	<10.0	Bis(2-chloroethoxy)methane	<60
Dibromochloromethane	<5.0	Bis(2-chloroisopropal)ether	<60
1,2-Dichlorobenzene	<5.0	Bis(2-ethylhexyl)phthalate	<60
1,3-Dichlorobenzene	<5.0	4-Bromophenyl-pheny ether	<60
1,4-Dichlorobenzene	<5.0	Butylbenzylphthalate	<60
1,1-Dichloroethane	<5.0	Chlordane	NP
1,2-Dichloroethane	<5.0	2-Chloronaphthalene	<60
1,1-Dichloroethene	<5.0	4-Chlorophenyl-phenylether	<60
cis-1,2-Dichloroethene	<5.0	Chrysene	<60
Trans-1,2-Dichloroethene	<5.0	Dibenzo(a,h) anthracene	<60
1,2-Dichloropropane	<5.0	Di-n-butylphthalate	<60
Cis-1,3-Dichloropropene	<5.0	1,2-Dichlorobenzene	<60
Trans-1,3-Dichloropropene	<5.0	1,3-Dichlorobenzene	<60
Ethylbenzene	<5.0	1,4-Dichlorobenzene	<60
Methylene Chloride	<5.0	3,3'-Dichlorobenzidine	<100
1,1,2,2-Tetrachloroethane	<5.0	Diethylphthalate	<60
Tetrachloroethene	<5.0	Dimethyl phthalate	<60
Toluene	<5.0	2,4-Dinitrotoluene	<60
1,1,1-Trichloroethane	<5.0	2,6-Dinitrotoluene	<60
1,1,2-Trichloroethane	<5.0	Di-n-octylphthalate	<60
Trichloroethylene	<5.0	Fluoranthene	<60
Trichlorofluoromethane	<50.0	Fluorene	<60
Vinyl Chloride	<10.0	Hexachlorobenzene	<60
o-Xylene	<1.0	Hexachlorobutadiene	<60
m-Xylene	<1.0	Hexachlorocyclopentadiene	<60
p-Xylene	<1.0	Hexachloroethane	<60
		Indeno(1,2,3-cd)pyrene	<60
	COLLECTION DATE	Isophorone	<60
PCB's & PESTICIDES (ug/L)	**Sunday, 06 Mar 94**	Naphthalene	<60
Alpha-BHC	<0.06	Nitrobenzene	<60
Beta-BHC	<0.06	N-Nitroso dimethyl amine	<60
Delta-BHC	<0.06		
Lindane	<0.06	N-Nitroso-di-n-propylamine	<60
Heptachlor	<0.06	N-Nitrosodiphenylamine	<60
Aldrin	<0.06	Phenanthrene	<60
Heptachlor Epoxide	<0.06	Pyrene	<60
Endosulfan I	<0.06	1,2,4-Trichlorobenzene	<60
Dieldrin	<0.10	Toxaphene	<60
4,4' DDE	<0.10		
Endrin	<0.10	**Acid Compounds (ug/L)**	
Endosulfan II	<0.10	P-Chloro-m-cresol	<60.0
4,4' DDD	<0.10	2-Chorophenol	<60.0
Endosulfan Sulfate	<0.10	2,4-Dichorophenol	<60.0
4,4-DDT	<0.20	2,4-Dimethylphenol	<60.0
Endrin Ketone	<0.10	2,4-Dinitrophenol	<300
Methoxychlor	<0.6	4,6-Dinitro-2-methylphenol	<300
Chlordane	NP	2-Nitrophenol	<60.0
Alpha-Chlorodane	<0.06	4-Nitrophenol	<300
Gamma-Chlorodane	<0.06	Pentachlorophenol	<300
Toxaphene	<6	Phenol	<60.0
Endrin Aldehyde	<0.10	2,4,6-Trichlorophenol	<60.0
Arochlor 1016	<1		
Arochlor 1221	<2	**Sample Number**	GN940075
Arochlor 1232	<1		CN940076
Arochlor 1242	<1		
Arochlor 1248	<1		
Arochlor 1254	<1		
Arochlor 1260	<1		
SAMPLE NUMBER	CN940076		

TABLE DG-1, SITE 7, NORTH BASE ACTIVITY
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994
Contributing Sources: Hanger 51 Maintenance, Engine Test Cell, and POL Facility

	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE	COLLECTION DATE
	Friday, 04 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
GROUP A ANALYTES				
Chemical Oxygen Demand (mg/L)	3160	2000	3910	5350
Oil and Grease (mg/L)	68.8	88	480	272
Total Petroleum Hydrocarbon (mg/L)	52	6	70.4	28.8
Total Phosphorus (mg/L)	83	26.4	51	140
GROUP D ANALYTES				
Cyanide	0.015	4.3	0.015	0.019
GROUP E ANALYTES				
Phenols (ug/L)	167	37	150	128
GROUP F ANALYTES				
Arsenic (mg/L)	<0.05	<0.05	<0.05	<0.05
Cadmium (mg/L)	0.007	0.019	0.003	0.012
Total Chromium (mg/L)	0.009	0.012	<0.005	0.015
Copper (mg/L)	0.22	0.27	0.093	0.31
Iron (mg/L)	4.4	7.1	1.9	8.4
Lead (mg/L)	<0.02	<0.02	<0.02	<0.02
Mercury (mg/L)	0.001	0.0006	<0.0005	0.0015
Nickel (mg/L)	0.028	0.024	0.012	0.038
Selenium	<0.05	<0.05	<0.05	<0.05
Silver (mg/L)	<0.005	<0.005	<0.005	<0.005
Zinc (mg/L)	2.4	2.4	0.87	3.2
ON SITE ANALYSES				
pH (units)	7.2	6	6.4	6.2
Temperature (°C)	12	12	12	16
GROUP G ANALYTES				
Residue (total)	7095	3801	2686	4937
SAMPLE NUMBERS	GN940023	GN940047	GN940077	GN940102
	GN940024	GN940048	GN940078	GN940103
	GN940025	GN940049	GN940079	GN940104
VOLATILE COMPOUNDS (ug/L)	Friday, 04 Mar 94	Saturday, 05 Mar 94	Sunday, 06 Mar 94	Monday, 07 Mar 94
Benzene	<10	<1.0	5.37	<10
Bromodichloromethane	<10	<1.0	<1.0	<10
Bromoform	<10	<1.0	<1.0	<10
Bromomethane	<10	12.33	<1.0	<10
Carbon tetrachloride	<10	<1.0	<1.0	<10
Chlorobenzene	<10	<1.0	<1.0	<10
Chloroethane	<10	<1.0	<1.0	<10
2-Chloroethyvinylether	<10	<1.0	<1.0	<10
Chloroform	<10	4.07	5.81	<10
Chloromethane	<10	<1.0	<1.0	<10
Chlorodibromomethane	<10	<1.0	<1.0	<10
1,2-Dichlorobenzene	<10	<1.0	1.4	<10
1,3-Dichlorobenzene	<10	<1.0	<1.0	<10
1,4-Dichlorobenzene	<10	<1.0	<1.0	<10
Dichlorodifluoromethane	<10	<1.0	<1.0	<10
1,1-Dichloroethane	<10	<1.0	<1.0	<10
1,2-Dichloroethane	<10	<1.0	<1.0	<10
1,1-Dichloroethene	<10	<1.0	<1.0	<10
Trans-1,2-Dichloroethene	<10	<1.0	<1.0	<10
1,2-Dichloropropane	<10	<1.0	<1.0	<10
Cis-1,3-Dichloropropene	<10	<1.0	<1.0	<10
Trans-1,3-Dichloropropene	<10	<1.0	<1.0	<10
Ethylbenzene	<10	<1.0	2.98	<10
Methylene Chloride	<10	<1.0	<1.0	<10
1,1,2,2-Tetrachloroethane	<10	<1.0	<1.0	<10
Tetrachloroethylene	<10	<1.0	<1.0	<10
Toluene	<10	<1.0	12.86	<10
1,1,1-Trichloroethane	<10	<1.0	<1.0	<10
1,1,2-Trichloroethane	<10	<1.0	<1.0	<10
Trichloroethylene	<10	<1.0	<1.0	<10
Trichlorofluoromethane	<10	<1.0	<1.0	<10
Vinyl Chloride	<10	<1.0	<1.0	<10
m-Xylene	<10	<1.0	** See Comment	<10
o-Xylene	<10	<1.0	8.79	<10
p-Xylene	<10	<1.0	13.85	<10

** - m- and p-xylene coelute. p-xylene result is the sum of both analytes.

TABLE DH-1, SITE 8, CIVIL ENGINEERING
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994
Contributing Sources: Civil Engineering and Forced Flush in Entomology

	COLLECTION DATE
GROUP A ANALYTES	Thursday, 03 Mar 94
Kjeldahl Nitrogen (total)	9.9
Chemical Oxygen Demand (mg/L)	61
Oil and Grease (mg/L)	16.3
Total Petroleum Hydrocarbon (mg/L)	9.5
Total Phosphorus (mg/L)	1
GROUP D ANALYTES	
Cyanide	<.005
GROUP E ANALYTES	
Phenols (ug/L)	<10
GROUP F ANALYTES	
Arsenic (mg/L)	<0.05
ON SITE ANALYSES	
pH (units)	6.2
Temperature (°C)	12
GROUP G ANALYTES	
Residue (total)	97
TOTAL ORGANIC HALIDES (ug/L) (9020)	110
SAMPLE NUMBERS	GN940026
	GN940028
Note that VOA sample GN940027 collected was broken	

TABLE DI-1 SITE 9, GSU BUILDING #5
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994
Contributing Sources: Building #5 Sanitary Effluent to Septic System

	COLLECTION DATE
GROUP A ANALYTES	Wednesday, 02 Mar 94
Ammonia	
Chemical Oxygen Demand (mg/L)	1060
Oil and Grease (mg/L)	52
Total Petroleum Hydrocarbon (mg/L)	21.6
Total Phosphorus (mg/L)	18.6
GROUP D ANALYTES	
Cyanide	<.005
GROUP E ANALYTES	
Phenols (ug/L)	11
GROUP F ANALYTES	
Arsenic (mg/L)	<0.05
Cadmium (mg/L)	0.003
Total Chromium (mg/L)	0.008
Copper (mg/L)	0.76
Iron (mg/L)	5.3
Lead (mg/L)	0.11
Mercury (mg/L)	0.0008
Selenium	<0.05
Silver (mg/L)	<0.005
Zinc (mg/L)	1.4
ON SITE ANALYSES	
pH (units)	8.9
Temperature (°C)	10
GROUP G ANALYTES	
Residue, (total)	939
SAMPLE NUMBERS	GN940001
	GN940002 Broken and resampled
VOLATILE COMPOUNDS (ug/L)	Wednesday, 09 Mar 94
Benzene	<10
Bromodichloromethane	<10
Bromoform	<10
Bromomethane	<10
Carbon tetrachloride	<10
Chlorobenzene	<10
Chloroethane	<10
2-Chloroethyvinylether	<10
Chloroform	<10
Chloromethane	<10
Chlorodibromomethane	<10
1,2-Dichlorobenzene	<10
1,3-Dichlorobenzene	<10
1,4-Dichlorobenzene	<10
Dichlorodifluoromethane	<10
1,1-Dichloroethane	<10
1,2-Dichloroethane	<10
1,1-Dichloroethene	<10
Trans-1,2-Dichloroethene	<10
1,2-Dichloropropane	<10
Cis-1,3-Dichloropropene	<10
Trans-1,3-Dichloropropene	<10
Ethylbenzene	<10
Methylene Chloride	<10
1,1,2,2-Tetrachloroethane	<10
Tetrachloroethylene	<10
Toluene	<10
1,1,1-Trichloroethane	<10
1,1,2-Trichloroethane	<10
Trichloroethylene	<10
Trichlorofluoromethane	<10
Vinyl Chloride	<10
m-Xylene	<10
o-Xylene	<10
p-Xylene	<10
Sample Number	GN940111

TABLE DJ-1, SITE 10, GSU BUILDING #2
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994
Contributing Sources: Building #2 (Vehicle Maintenance) Oil/Water Separator

	COLLECTION DATE	
GROUP A ANALYTES	Wednesday, 02 Mar 94	
Chemical Oxygen Demand (mg/L)		510
Oil and Grease (mg/L)		216
Total Petroleum Hydrocarbon (mg/L)		136
Total Phosphorus (mg/L)		1
GROUP D ANALYTES		
Cyanide		0.015
GROUP E ANALYTES		
Phenols (ug/L)		30
GROUP F ANALYTES		
Arsenic (mg/L)	<0.05	
Cadmium (mg/L)		0.22
Total Chromium (mg/L)		0.24
Copper (mg/L)		1.2
Iron (mg/L)		58
Lead (mg/L)		1.7
Mercury (mg/L)	<0.0005	
Nickel (mg/L)		0.04
Selenium	<0.05	
Silver (mg/L)	<0.005	
Zinc (mg/L)		3.1
ON SITE ANALYSES		
pH (units)		9.58
Temperature (°C)		6.5
GROUP G ANALYTES		
Residue (total)		1408
SAMPLE NUMBERS	GN940003	
	GN940004 Broken and Resampled	
	GN940112	
VOLATILE COMPOUNDS (ug/L)	Monday, 07 Mar 94	
Benzene	<10	
Bromodichloromethane	<10	
Bromoform	<10	
Bromomethane	<10	
Carbon tetrachloride	<10	
Chlorobenzene	<10	
Chloroethane	<10	
2-Chloroethyvinylether	<10	
Chloroform	<10	
Chloromethane	<10	
Chlorodibromomethane	<10	
1,2-Dichlorobenzene	<10	
1,3-Dichlorobenzene	<10	
1,4-Dichlorobenzene	<10	
Dichlorodifluoromethane	<10	
1,1-Dichloroethane	<10	
1,2-Dichloroethane	<10	
1,1-Dichloroethene	<10	
Trans-1,2-Dichloroethene	<10	
1,2-Dichloropropane	<10	
Cis-1,3-Dichloropropene	<10	
Trans-1,3-Dichloropropene	<10	
Ethylbenzene	<10	
Methylene Chloride	<10	
1,1,2,2-Tetrachloroethane	<10	
Tetrachloroethylene	<10	
Toluene		61.7
1,1,1-Trichloroethane	<10	
1,1,2-Trichloroethane	<10	
Trichloroethylene	<10	
Trichlorofluoromethane	<10	
Vinyl Chloride	<10	
m-Xylene	**	
o-Xylene		10
p-Xylene	<10	

** m- and p- xylene coelute. p-xylene result is the sum of both analytes

TABLE DK-1, POTABLE WATER
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994

	COLLECTION DATE		COLLECTION DATE	Collected at Badin GSU Bldg #5
GROUP A ANALYTES	Monday, 07 Mar 94	VOLATILE COMPOUNDS (ug/L)	Monday, 07 Mar 94	Monday, 07 Mar 94
Ammonia	<.2	Benzene	<0.5	<0.5
Kjeldahl Nitrogen (total)	0.7	Bromodichloromethane	8.4	<0.5
Chemical Oxygen Demand (mg/L)	44	Bromoform	<0.5	<0.5
Oil and Grease (mg/L)	0.6	Bromomethane	<0.5	<0.5
Total Phosphorus (mg/L)	<.10	n-Butylbnezene	<0.5	<0.5
		sec-Butylbenzene	<0.5	<0.5
GROUP D ANALYTES		tert-Butylbenzene	<0.5	<0.5
Cyanide	<.005	Carbon tetrachloride	<0.5	<0.5
		Chlorobenzene	<0.5	<0.5
GROUP E ANALYTES		Chloroethane	<0.5	<0.5
Phenols (ug/L)	<10	2-Chloroethyvinylether	<0.5	<0.5
		Chloroform	42	<0.5
GROUP F ANALYTES		Chloromethane	<0.5	<0.5
Arsenic (mg/L)	<0.05	Chlorodibromomethane	0.8	<0.5
Barium	<0.01	2-Chlorotoluene	<0.5	<0.5
Beryllium (mg/L)	<0.005	4-Chlorotoluene	<0.5	<0.5
Boron	<0.05	p-Cymene	<0.5	<0.5
Cadmium (mg/L)	<0.001	Dibromomethane	<0.5	<0.5
Calcium	8.6	1,2-Dichlorobenzene	<0.5	<0.5
Total Chromium (mg/L)	<0.005	1,3-Dichlorobenzene	<0.5	<0.5
Copper (mg/L)	<0.005	1,4-Dichlorobenzene	<0.5	<0.5
Hardness	27	Dichlorodifluoromethane	<0.5	<0.5
Iron (mg/L)	0.28	1,1-Dichloroethane	<0.5	0.6
Lead (mg/L)	<0.02	1,2-Dichloroethane	<0.5	10.5
Magnesium (mg/L)	1.3	1,1-Dichloroethene	<0.5	<0.5
Mercury (mg/L)	<0.0005	Cis-1,2-Dichloroethene	<0.5	<0.5
Nickel (mg/L)	<0.005	Trans-1,2-Dichloroethene	<0.5	<0.5
Selenium	<0.05	1,3-Dichloropropane	<0.5	<0.5
Silver (mg/L)	<0.005	2,2-Dichloropropane	<0.5	<0.5
Sodium	7.1	1,1-Dichloropropane	<0.5	<0.5
Thallium	<0.01	1,2-Dichloropropane	<0.5	<0.5
Zinc (mg/L)	0.05	Cis-1,3-Dichloropropene	<0.5	<0.5
		Trans-1,3-Dichloropropene	<0.5	<0.5
ON SITE ANALYSES		Ethylbenzene	<0.5	<0.5
pH (units)	Not Performed	Hexachlorobutadiene	<0.5	<0.5
Temperature (°C)	Not Performed	Isopropylbenzene	<0.5	<0.5
		Methylene Chloride	<0.5	<0.5
GROUP G ANALYTES		Naphthalene	<0.5	<0.5
Alkalinity (total)	23	n-Propylbenzene	<0.5	<0.5
Alkalinity, bicarbonate	23	Styrene	<0.5	<0.5
Residue, filterable	66	1,1,1,2-Tetrachloroethane	<0.5	<0.5
SAMPLE NUMBERS	GN940105	1,1,2,2-Tetrachloroethane	<0.5	<0.5
		Tetrachloroethylene	<0.5	<0.5
		Toluene	<0.5	<0.5
		1,2,3-Trichlorobenzene	<0.5	<0.5
		1,2,4-Trichlorobenzene	<0.5	<0.5
		1,1,1-Trichloroethane	<0.5	<0.5
		1,1,2-Trichloroethane	<0.5	0.9
		Trichloroethylene	<0.5	<0.5
		Trichlorofluoromethane	<0.5	<0.5
		1,2,3-Trichloropropane	51.2	<0.5
		Total Trihalomethane	<0.5	<0.5
		1,2,4-trimethylbenzene	<0.5	<0.5
		1,3,5-Trimethylbenzene	<0.5	<0.5
		Vinyl Chloride	<0.5	<0.5
		m-Xylene	<0.5	<0.5
		o-Xylene	<0.5	<0.5
		p-Xylene		
		Sample numbers	GP940108	GP940113

TABLE DL-1, SPIKE SAMPLES and REAGENT BLANK
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994
Contributing Sources: Armstrong Laboratory Grade Water and Commercial Spikes

	COLLECTION DATE	COLLECTION DATE	Parameter Window	Reagent Blank
GROUP A ANALYTES	Saturday, 06 Mar 94	Saturday, 06 Mar 94		
Ammonia	0.38	0.36		<.2
Kjeldahl Nitrogen (mg/L)	8.3	7.8	(5.9 - 8.5)	
Chemical Oxygen Demand (mg/L)	152	140	(136 mg/L - 184 mg/L)	17
Oil and Grease (mg/L)	86.4	140.8	(32.0 mg/L - 56.0 mg/L)	
Total Petroleum Hydrocarbon (mg/L)	86.4	140.8	Not spiked	
Total Phosphorus (mg/L)	6.4	5	(4.3 - 5.6)	<.10
GROUP D ANALYTES				
Cyanide	0.4	0.41	(0.35 - 0.59)	<.005
GROUP E ANALYTES				
Phenols (ug/L)	71	68	Not spiked	<10
GROUP F ANALYTES				
Aluminum	<0.05	<0.05	Not spiked	
Arsenic (mg/L)	<0.05	<0.05	(38.9 ug/L - 60.3 ug/L)	
Barium	0.1		Not spiked	
Beryllium (mg/L)	<0.005	<0.005	Not spiked	
Boron	<0.05	<0.05	Not spiked	
Cadmium (mg/L)	0.005	0.003	Not spiked	<0.001
Total Chromium (mg/L)	0.045	0.044	Not spiked	<0.005
Copper (mg/L)	0.05	0.048	(43.0 ug/L - 56.0 ug/L)	<0.005
Iron (mg/L)	<0.01	<0.01	Not spiked	0.02
Lead (mg/L)	0.05	0.04	(40.3 ug/L - 60.5 ug/L)	<0.02
Mercury (mg/L)	0.0012	0.0013	(1.46 ug/L - 2.58 ug/L)	<0.0005
Nickel (mg/L)	<0.005	<0.005	Not spiked	<0.005
Selenium	<0.05	<0.05	Not spiked	NR
Silver (mg/L)	0.007	0.007	(8.21 ug/L - 11.73 ug/L)	<0.005
Zinc (mg/L)	<0.01	<0.01	Not spiked	<0.01
SAMPLE NUMBERS	GN940081	GN940083		GN940082
		GN940080		

TABLE DL-2, QC/QA - EQUIPMENT BLANK
Base Survey: NORTH CAROLINA AIR NATIONAL GUARD BASE
Survey Dates: 1 - 9 March 1994

	COLLECTION DATE		
GROUP A ANALYTES	Friday, 04 Mar 94 (Site 4)	VOLATILE COMPOUNDS (ug/L)	Saturday, 05 Mar 94 (Site 4)
Ammonia	<.2	Benzene	<1.0
Kjeldahl Nitrogen (total)	0.7	Bromodichloromethane	<1.0
Chemical Oxygen Demand (mg/L)	28	Bromoform	<1.0
Oil and Grease (mg/L)	0.8	Bromomethane	<1.0
Total Petroleum Hydrocarbon (mg/L)	<.3	n-Butylbnezene	<1.0
Total Phosphorus (mg/L)	<.10	sec-Butylbenzene	<1.0
		tert-Butylbenzene	<1.0
GROUP D ANALYTES		Carbon tetrachloride	<1.0
Cyanide	<.005	Chlorobenzene	<1.0
		Chloroethane	<1.0
GROUP E ANALYTES		2-Chloroethyvinylether	<1.0
Phenols (ug/L)	<10	Chloroform	<1.0
		Chloromethane	<1.0
GROUP F ANALYTES		Chlorodibromomethane	<1.0
Aluminum	0.06	2-Chlorotoluene	<1.0
Arsenic (mg/L)	<0.05	4-Chlorotoluene	<1.0
Barium	<0.01	p-Cymene	<1.0
Beryllium (mg/L)	<0.005	Dibromomethane	<1.0
Boron	<0.05	1,2-Dichlorobenzene	<1.0
Cadmium (mg/L)	<0.001	1,3-Dichlorobenzene	<1.0
Total Chromium (mg/L)	<0.005	1,4-Dichlorobenzene	<1.0
Copper (mg/L)	<0.005	Dichlorodifluoromethane	<1.0
Iron (mg/L)	0.19	1,1-Dichloroethane	<1.0
Lead (mg/L)	<0.02	1,2-Dichloroethane	<1.0
Mercury (mg/L)	<0.0005	1,1-Dichloroethene	<1.0
Nickel (mg/L)	<0.005	Cis-1,2-Dichloroethene	<1.0
Selenium	<0.05	Trans-1,2-Dichloroethene	<1.0
Silver (mg/L)	<0.005	1,3-Dichloropropane	<1.0
Zinc (mg/L)	<0.01	2,2-Dichloropropane	<1.0
		1,1-Dichloropropane	<1.0
ON SITE ANALYSES		1,2-Dichloropropane	<1.0
pH (units)	Not Performed	Cis-1,3-Dichloropropene	<1.0
Temperature (°C)	Not Performed	Trans-1,3-Dichloropropene	<1.0
		Ethylbenzene	<1.0
GROUP G ANALYTES		Hexachlorobutadiene	<1.0
Residue (total)	48	Isopropylbenzene	<1.0
		Methylene Chloride	<1.0
SAMPLE NUMBERS	GN940050	Naphthalene	<1.0
	CN940051	n-Propylbenzene	<1.0
		Styrene	<1.0
		1,1,1,2-Tetrachloroethane	<1.0
		1,1,2,2-Tetrachloroethane	<1.0
		Tetrachloroethylene	<1.0
		Toluene	<1.0
		1,2,3-Trichlorobenzene	<1.0
		1,2,4-Trichlorobenzene	<1.0
		1,1,1-Trichloroethane	<1.0
		1,1,2-Trichloroethane	<1.0
		Trichloroethylene	<1.0
		Trichlorofluoromethane	<1.0
		1,2,3-Trichloropropane	<1.0
		Total Trihalomethane	<1.0
		1,2,4-trimethylbenzene	<1.0
		1,3,5-Trimethylbenzene	<1.0
		Vinyl Chloride	<1.0
		m-Xylene	<1.0
		o-Xylene	<1.0
		p-Xylene	<1.0
		Sample numbers	GN940052